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Plan Alternatives and Environmental Impact Statement

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U. S. Department of the Interior
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Bureau of Land Management
California State Office
State Director
Sacramento, California

California Desert Advisory Committee

Desert Planning Staff
Riverside, California

Riverside and Bakersfield Districts
BLM Staff

appendix:

the CALIFORNIA DESERT CONSERVATION AREA

Plan Alternatives and Environmental Impact Statement

DRAFT

FEBRUARY 1980

James B. Ruch
California State Director
Bureau of Land Management

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APPENDIX 1

LAWS AND POLICIES RELATING TO THE PLANNING AND MANAGEMENT OF THE CALIFORNIA DESERT CONSERVATION AREA

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I. Purpose, Policy, and Objectives for Public Land Planning and Management.

A. Federal Land Policy and Management Act of 1976 (FLPMA), (PL 94-579, 43 USC 1701, 90 Stat. 2743).

Sec. 102. (a) The Congress declares that it is the policy of the United States that--

(2) the national interest will be best realized if the public lands and their resources are periodically and systematically inventoried and their present and future use is projected through a land use planning process coordinated with other Federal and State planning efforts;

(7) goals and objectives be established by law as guidelines for public land use planning, and that management be on the basis of multiple use and sustained yield unless otherwise specified by law;

(8) the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use;

(12) the public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands including implementation of the Mining and Minerals Policy Act of 1970 (84 Stat. 1876, 30 U.S.C. 21a) as it pertains to the public lands.

B. National Environmental Policy Act of 1969 (NEPA), (PL 91-190, 42 USC 4321, 83 Stat. 852).

Sec. 101. (a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

Sec. 102. The Congress authorizes and directs that, to the fullest extent possible:

(1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and

(2) all agencies of the Federal Government shall--

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on--

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by Section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;

C. Executive Order No. 11514. Protection and Enhancement of Environmental Quality, (March 7, 1970, 35 F.R. 4247).

Sec. 2. Responsibilities of Federal agencies. Consonant with Title I of the National Environmental Policy Act of 1969, hereafter referred to as the "Act", the heads of Federal agencies shall:

(a) Monitor, evaluate, and control on a continuing basis their agencies' activities so as to protect and enhance the quality of the environment. Such activities shall include those directed to controlling pollution and enhancing the environment and those designed to accomplish other program objectives which may affect the quality of the environment. Agencies shall develop programs and measures to protect and enhance environmental quality and shall assess progress in meeting the specific objectives of such activities. Heads of agencies shall consult with appropriate Federal, State and local agencies in carrying out their activities as they affect the quality of the environment.

II. The California Desert Conservation Area (CDCA).

A. Background (FLPMA Sec. 601(a)).

The Congress finds that:

(1) the California desert contains historical, scenic, archaeological, environmental, biological, cultural, scientific, educational, recreational, and economic resources that are uniquely located adjacent to an area of large population;

(2) the California desert environment is a total ecosystem that is extremely fragile, easily scarred, and slowly healed;

(3) the California desert environment and its resources, including certain rare and endangered species of wildlife, plants, and fishes, and numerous archaeological and historic sites, are seriously threatened by air pollution, inadequate Federal management authority, and pressures of increased use, particularly recreational use, which are certain to intensify because of the rapidly growing population of southern California;

(4) the use of all California desert resources can and should be provided for in a multiple use and sustained yield management plan to conserve these resources for future generations, and to provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles.

B. Policy (FLPMA, Sec. 601(b)).

It is the purpose of this section to provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality.

C. Implementation (FLPMA, Sec. 601(d), (e)).

(d) The Secretary, in accordance with Section 202 of this Act, shall prepare and implement a comprehensive, long-range plan for the management, use, development, and protection of the public lands within the California Desert Conservation Area. Such plan shall take into account the principles of multiple use and sustained yield in providing for resource use and development, including, but not limited to, maintenance of environmental quality, rights-of-way, and mineral development. Such plan shall be completed and implementation thereof initiated on or before September 30, 1980.

(e) During the period beginning on the date of approval of this Act and ending on the effective date of implementation of the comprehensive, long-range plan, the Secretary shall execute an interim program to manage, use, and protect the public lands, and their resources now in danger of destruction, in the California Desert Conservation Area, to provide for the public use of such lands in an orderly and reasonable manner such as through the development of campgrounds and visitor centers, and to provide for a uniformed desert ranger force.

III. Definitions (FLPMA Sec. 103).

Sec. 103. Without altering in any way the meaning of the following terms as used in any other statute, whether or not such statute is referred to in, or amended by, this Act, as used is this Act--

(a) The term "areas of critical environmental concern" means areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

(c) The term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

(d) The term "public involvement" means the opportunity for participation by affected citizens in rulemaking, decisionmaking, and planning with respect to the public lands, including public meetings or hearings held at locations near the affected lands, or advisory mechanisms, or such other procedures as may be necessary to provide public comment in a particular instance.

(h) The term "sustained yield" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use.

(j) The term "withdrawal" means withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of Federal land, other than "property" governed by the Federal Property and Administrative Services Act, as amended (40 U.S.C. 472) from one department, bureau or agency to another department, bureau or agency.

IV. Land Use Planning (FLPMA, Sec. 202)

A. Policy

Sec. 202. (a) The Secretary shall, with public involvement and consistent with the terms and conditions of this Act, develop, maintain, and, when appropriate, revise land use plans which provide by tracts or areas for the use of the public lands. Land use plans shall be developed for the public lands regardless of whether such lands previously have been classified, withdrawn, set aside, or otherwise designated for one or more uses.

(b) In the development and revision of land use plans, the Secretary of Agriculture shall coordinate land use plans for lands in the National Forest System with the land use planning and management programs of and for Indian tribes by, among other things, considering the policies of approved tribal land resource management programs.

(c) In the development and revision of land use plans, the Secretary shall--

(1) use and observe the principles of multiple use and sustained yield set fourth in this and other applicable law;
(2) use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences;
(3) give priority to the designation and protection of areas of critical environmental concern;
(4) rely, to the extent it is available, on the inventory of the public lands, their resources, and other values;
(5) consider present and potential uses of the public lands;
(6) consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values;
(7) weigh long-term benefits to the public against short-term benefits;
(8) provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans; and
(9) to the extent consistent with the laws governing the administration of the public lands, coordinate the land

use inventory, planning, and management activities of or for such lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located, including, but not limited to, the statewide outdoor recreation plans developed under the Act of September 3, 1964 (78 Stat. 897), as amended, and of or for Indian tribes by, among other things, considering the policies of approved State and tribal land resource management programs.

V. Public Involvement

A. Policy

1. FLPMA, Sec. 202(f).

The Secretary shall allow an opportunity for public involvement and by regulation shall establish procedures, including public hearings where appropriate, to give Federal, State, and local governments and the public, adequate notice and opportunity to comment upon and participate in the formulation of plans and programs relating to the management of the public lands.

2. E.O. 11514. Protection and Enhancement of Environmental Quality.

Sec. 2. Responsibilities of Federal agencies.

(b) Develop procedures to ensure the fullest practicable provision of timely public information and understanding of Federal plans and programs with environmental impact in order to obtain the views of interested parties. These procedures shall include, whenever appropriate, provision for public hearings, and shall provide the public with relevant information, including information on alternative courses of action. Federal agencies shall also encourage State and local agencies to adopt similar procedures for informing the public concerning their activities affecting the quality of the environment.

VI. Resource Programs

A. Lands

1. Description of Program Activity. The lands and realty program includes classifying and tenure adjusting to support Bureau and other agency needs; disposes of and leases public lands found suitable for the legitimate needs of the private sector; provides for recreation and public purpose uses; coordinates and grants rights-of-way to cross public lands; mitigates and resolves unauthorized use and occupancy of public lands; coordinates land acquisitions through exchange and purchase; reviews and processes withdrawal actions both to restore and remove public lands from the operation of non-discretionary laws or acts; provides for the temporary use and occupancy of public lands by the private and governmental sectors; and maintains a land and title record system.

2. Policy. FLPMA.

a. Declaration of Policy.

Sec. 102(a)(1).

> The public lands shall be retained in Federal ownership, unless as a result of the land use planning procedure provided for in this Act, it is determined that disposal of a particular parcel will serve the national interest.

Sec. 302.

(a) The Secretary shall manage the public lands under principles of multiple use and sustained yield, in accordance with the land use plans developed by him under Section 202 of this Act when they are available, except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such law.

(b) In managing the public lands, the Secretary shall, subject to this Act and other applicable law and under such terms and conditions as are consistent with such law, regulate, through easements, permits, leases, licenses, published rules, or other instruments as the Secretary deems appropriate, the use, occupancy, and development of the public lands, including, but not limited to, long-term leases to permit individuals to utilize public lands for habitation, cultivation, and the development of small trade or manufacturing concerns.

b. Sales, FLPMA Sec. 203.

(a) A tract of the public lands (except land in units of the National Wilderness Preservation System, National Wild and Scenic Rivers Systems, and National System of Trails) may be sold under this Act where, as a result of land use planning required under Section 202 of this Act, the Secretary determines that the sale of such tract meets the following disposal criteria:

(1) such tract because of its location or other characteristics is difficult and uneconomic to manage as part of the public lands, and is not suitable for management by another Federal department or agency; or
(2) such tract was acquired for a specific purpose and the tract is no longer required for that or any other Federal purpose; or
(3) disposal of such tract will serve important public objectives, including but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.

c. Withdrawals, FLPMA Sec. 204.

(a) On and after the effective data of this Act the Secretary is authorized to make, modify, extend, or revoke withdrawals but only in accordance with the provisions and limitations of this section.

(f) All withdrawals and extensions thereof, whether made prior to or after approval of this Act, having a specific period shall be reviewed by the Secretary toward the end of the withdrawal period and may be extended or further extended only upon compliance with the provisions of subsection (c)(1) or (d), whichever is applicable, and only if the Secretary determines that the purpose for which the withdrawal was first made requires the extension, and then only for a period no longer than the length of the original withdrawal period. The Secretary shall report on such review and extensions to the Committees on Interior and Insular Affairs of the House of Representatives and the Senate.

(1)(1) The Secretary shall, within fifteen years of the date of enactment of this Act, review withdrawals existing on the date of approval of this Act, in the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming of (1) all Federal lands other than withdrawals of the public lands administered by the Bureau of Land Management . . . .

d. Acquisitions, FLPMA Sec. 205.

(a) Notwithstanding any other provisions of law, the Secretary, with respect to the public lands and the Secretary of Agriculture, with respect to the acquisition of access over non-Federal lands to units of the National Forest System, are authorized to acquire pursuant to this Act by purchase, exchange, donation, or eminent domain, lands or interests therein: Provided, that with respect to the public lands, the Secretary may exercise the power of eminent domain only if necessary to secure access to public lands, and then only if the lands so acquired are confined to as narrow a corridor as is necessary to serve such purpose. Nothing in this subsection shall be construed as expanding or limiting the authority of the Secretary of Agriculture to acquire land by eminent domain within the boundaries of units of the National Forest System.

(b) Acquisitions pursuant to this section shall be consistent with the mission of the department involved and with applicable departmental land-use plans.

(c) Lands and interests in lands acquired by the Secretary pursuant to this section or section 206 shall, upon acceptance of title, become public lands, and, for the administration of public land laws not repealed by this Act, shall remain public lands.

e. Exchanges, FLPMA Sec. 206(a).

A tract of public land or interests therein may be disposed of by exchange by the Secretary under this Act and a tract of land or interests therein within the National Forest System may be disposed of by exchange by the Secretary of Agriculture under applicable law where the Secretary concerned determines that the public interest will be well served by making that exchange: Provided, That when considering public interest the Secretary concerned shall give full consideration to better Federal land management and the needs of State and local people, including needs for lands for the economy, community expansion, recreation areas, food, fiber, minerals, and fish and wildlife and the Secretary concerned finds that the values and the objectives which Federal lands or interests to be conveyed may serve if retained in Federal ownership are not more than the values of the non-Federal lands or interests and the public objectives they could serve if acquired.

f. Recreation and Public Purpose Act, FLPMA Sec. 212.

The Recreation and Public Purposes Act of 1926 (44 Stat. 741, as amended; 43 U.S.C. 869-4), is further amended as follows: (a) The second sentence of subsection (a) of the first section of the Act (43 U.S.C. 869(a)) is amended to read as follows: "Before the land may be disposed of under this Act it must be shown to the satisfaction of the Secretary that the land is to be used for an established or definitely proposed project, that the land involved is not of national significance nor more than is reasonably necessary for the proposed use, and that for proposals of over 640 acres comprehensive land use plans and zoning regulations applicable to the area in which the public lands to be disposed of are located have been adopted by the appropriate State or local authority. The Secretary shall provide an opportunity for participation by affected citizens in disposals under this Act, including public hearings or meetings where he deems it appropriate to provide public comments, and shall hold at least one public meeting on any proposed disposal of more than six hundred forty acres under this Act."

g. Rights-of-Way.

(1) FLPMA Sec. 501.

(a) The Secretary, with respect to the public lands and, the Secretary of Agriculture, with respect to lands within the National Forest System (except in each case land designated as wilderness), are authorized to grant, issue, or renew rights-of-way over, upon, under or through such lands for--
(1) reservoirs, canals, ditches, flumes, laterals, pipes, pipelines, tunnels and other facilities

and systems for impoundment, storage, transportation, or distribution of water;

(2) pipelines and other systems for the transportation or distribution of liquids and gases, other than water and other than oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom, and for storage and terminal facilities in connection therewith;
(3) pipelines, slurry and emulsion systems, and conveyor belts for transportation and distribution of solid materials, and facilities for the storage of such materials in connection therewith;
(4) systems for generation, transmission, and distribution of electric energy, except that the applicant shall also comply with all applicable requirements of the Federal Power Commission under the Federal Power Act of 1935 (49 Stat. 847; 16 U.S.C. 791);
(5) systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communication;
(6) roads, trails, highways, railroads, canals, tunnels, tramways, airways, livestock driveways, or other means of transportation except where such facilities are constructed and maintained in connection with commercial recreation facilities on lands in the National Forest System; or
(7) such other necessary transportation or other systems or facilities which are in the public interest and which require rights-of-way over, upon, under, or through such lands.

(2) FLPMA Sec. 503.

In order to minimize adverse environmental impacts and the proliferation of separate rights-of-way, the utilization of rights-of-way in common shall be required to the extent practical, and each right-of-way or permit shall reserve to the Secretary concerned the right to grant additional rights-of-way or permits for compatible uses on or adjacent to rights-of-way granted pursuant to this Act. In designating right-of-way corridors and in determining whether to require that rights-of-way be confined to them, the Secretary concerned shall take into consideration national and State land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices. The Secretary concerned shall issue regulations containing the criteria and procedures he will use in designating such corridors. Any existing transportation and utility corridors may be designated as transportation and utility corridors pursuant to this subsection without further review.

(3) FLPMA Sec. 505: Each right-of-way shall contain:

(a) terms and conditions which will:

        - (1) carry out the purposes of this Act and rules and regulations issued thereunder;
        - (2) minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise protect the environment;
        - (3) require compliance with applicable air and water quality standards established by or pursuant to applicable Federal or State law;
        - (4) require compliance with State standards for public health and safety, environmental protection, and siting, construction, operation, and maintenance of or for rights-of-way for similar purposes if those standards are more stringent than applicable Federal standards; and

    - (b) such terms and conditions as the Secretary concerned deems necessary to:

        - (1) protect Federal property and economic interests;
        - (2) manage efficiently the lands which are subject to the right-of-way or adjacent thereto and protect the other lawful users of the lands adjacent to or traversed by such right-of-way;
        - (3) protect lives and property;
        - (4) protect the interests of individuals living in the general area traversed by the right-of-way who rely on the fish, wildlife, and other biotic resources of the area for subsistence purposes;
        - (5) require location of the right-of-way along a route that will cause least damage to the environment, taking into consideration feasibility and other relevant factors;
        - (6) otherwise protect the public interest in the lands traversed by the right-of-way or adjacent thereto.

(4) FLPMA Sec. 507.

- (a) The Secretary concerned may provide under applicable provisions of this title for the use of any department or agency of the United States a right-of-way over, upon, under or through the land administered by him, subject to such terms and conditions as he may impose.
- (b) Where a right-of-way has been reserved for the use of any department or agency of the United States, the Secreatry shall take no action to terminate, or otherwise limit, that use without the consent of the head of such department or agency.

h. Existing Rights, FLPMA Sec. 701(a).

Nothing in this Act, or in any amendment made by this Act, shall be construed as terminating any valid lease, permit, patent, right-of-way, or other land use right or authorization existing on the date of approval of this Act.

3. Other legislation.

a. Recreation and Public Purposes Act of 1926 (43 U.S.C. 869 to 869-4, 44 Stat. 741).

Sec. 869(a)(See Section VI A2f above - FLPMA 212).

The Secretary of the Interior upon application filed by a duly qualified applicant under section 869-1 of this title may, in the manner prescribed by sections 869 to 869-4 of this title, dispose of any public lands to a State, Territory, county, municipality, or other State, Territorial, or Federal instrumentality or political subdivision for any public purposes, or to a nonprofit corporation or nonprofit association for any recreational or any public purpose consistent with its articles of incorporation or other creating authority. Before the land may be disposed of under sections 869 to 869-4 of this title it must be shown to the satisfaction of the Secretary that the land is to be used for an established or definitely proposed project.

b. Unlawful Inclosures or Occupancy Act, 1885 (43 U.S.C. 1061, 23 Stat. 321).

All inclosures of any public lands in any State or Territory of the United States, heretofore or to be hereafter made, erected, or constructed by any person, party, association, or corporation, to any of which land included within the inclosure the person, party, association, or corporation making or controlling the inclosure had no claim or color of title made or acquired in good faith, or an asserted right thereto by or under claim, made in good faith with a view to entry thereof at the proper land office under the general laws of the United States at the time any such inclosure was or shall be made, and declared to be unlawful, and the maintenance, erection, construction, or control of any such inclosure is forbidden and prohibited; and the assertion of a right to the exclusive use and occupancy of any part of the public lands of the United States,in any State or any of the Territories of the United States, without claim, color of title, or asserted right as above specified as to inclosure, is likewise declared unlawful, and prohibited.

c. CFR Title 43. Subpart 2621--Indemnity Selections (June 13, 1970, 35 F.R. 9607)

Sec. 2621.0-2. Objectives and Background.

Generally, grants made by Statehood Acts to the various States of school sections 16 and 36, and in addition, sections 2 and 32 in Arizona, New Mexico, and Utah, attach to a school sections on the date of acceptance or approval of the plat of survey thereof. If the acceptance or approval was prior to the granting act, or to the date of admission of the State into the Union, the grant attaches either on the date of approval of the act or the date of admission into the Union, whichever is the later date. However, if on the date the grant would otherwise attach, the land is appropriated under some applicable public land law, the grant does not attach, and the State is entitled to indemnity therefore as provided in the regulations in this subpart.

B. Minerals

1. Description of Program Activity. The Minerals Program Activity includes mining claim recordation, adjudicating mineral patent applications; economic analysis, appraisal, and disposing of minerals by lease, license, and permit; coordinating exploration and mining activities with other land uses; and providing protection and rehabilitation of mined land (1603.12B1).

2. Policy (FLPMA).

   a. The public lands will be managed in a manner which recognizes the Nation's need for domestic sources of minerals . . . from the public lands including implementation of the Mining and Mineral Policy Act of 1970 as it pertains to the public lands. (Sec. 102(a)(12)).

   b. Subject to valid existing rights, nothing in the Act shall affect the applicability of the United States mining laws on the public lands within the California Desert Conservation Area, except that all mining claims located on public lands within the California Desert Conservation Area shall be subject to such reasonable regulations as the Secretary may prescribe to effectuate the purposes of this section. Any patent issued on any such mining claim shall recite this limitation and continue to be subject to such regulations. Such regulations shall provide for such measures as may be reasonable to protect the scenic, scientific, and environmental values of the public lands of the California Desert Conservation Area against undue impairment, and to assure against pollution of the streams and waters within the California Desert Conservation Area. Sec. 601(f).

   c. During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness, subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on the date of approval of this Act: Provided, That, in managing the public lands the Secretary shall by regulation or otherwise take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection. Unless previously withdrawn from appropriation under the mining laws, such lands shall continue to be subject to such appropriation during the period of review unless withdrawn by the Secretary under the procedures of section 204 of this Act for reasons other than preservation of their wilderness character. Once an area has been designated for preservation as wilderness, the provisions of the Wilderness Act which apply to national forest wilderness areas shall apply with respect to the administration and use of such designated area, including mineral surveys required by section 4(d)(2) of the Wilderness Act, and mineral development, access, exchange of lands, and ingress and egress for mining claimants and occupants. Sec. 603(c).

d. The owner of an unpatented lode or placer mining claim located prior to the date of this Act shall, within the three-year period following the date of the approval of this Act and prior to December 31 of each year thereafter, file the instruments required by paragraphs (1) and (2) of this subsection. The owner of an unpatented lode or placer mining claim located after the date of this Act shall, prior to December 31 of each year following the calendar year in which the said claim was located, file the instruments required by paragraphs (1) and (2) of this subsection: Sec. 314(a).

e. The failure to file such instruments as required by subsections (a) and (b) shall be deemed conclusively to constitute an abandonment of the mining claim or mill or tunnel site by the owner; but it shall not be considered a failure to file if the instrument is defective or not timely filed for record under other Federal laws permitting filing or recording thereof, or if the instrument is filed for record by or on behalf of some but not all of the owners of the mining claim or mill or tunnel site. Sec. 314(c).

3. Other legislation.

a. Mining Law of 1872. (30 U.S.C. 21, 17 Stat. 91)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that all valuable mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and purchase, and the lands in which they are found to occupation and purchase, by citizens of the United States and those who have declared their intention to become such, under regulations prescribed by law, and according to the local customs or rules of miners, in the several mining districts, so far as the same are applicable and not inconsistent with the laws of the United States.

b. Mineral Leasing Act of 1920, as Amended (30 U.S.C. 181-192)

Resume: Deposits of coal, phosphate, sodium, oil, oil shale or gas on public lands and National Forests were made subject to exploration and production only under permit, license or lease. Required payment of annual rentals based on acreage plus graduated scale of royalties based on mineral production. Successful prospectors given perference rights to lease the deposits found. Otherwise, leases on known deposits are issued to the highest bidder. Excepted from the 1920 Act; sodium deposits in San Bernardino County, California (later included); helium gas production reserved to the U.S..

1973 Amendments (PL 93-153, 30 U.S.C. 185, 87 Stat. 576).

Sec. 101. Section 28 of the Mineral Leasing Act of 1920 (41 Stat. 449), as amended (30 U.S.C. 185), is further amended to read as follows:

Sec. 28. (a) Rights-of-way through any Federal lands may be granted by the Secretary of the Interior or appropriate agency head for pipeline purposes for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom to any applicant possessing the qualifications provided in section 101 of this title, in accordance with the provisions of this section.

c. Mineral Materials Sales Act, 1955 (30 U.S.C. 601, 69 Stat. 367).

The Secretary, under such rules and regulations as he may prescribe, may dispose of mineral materials (including but not limited to common varieties of the following: sand, stone, gravel, pumice, pumicite, cinders, and clay) and vegetative materials (including but not limited to yucca, manzanita, mesquite, cactus, and timber or other forest products) on public lands of the United States, including, for the purposes of this subchapter, land described in sections 1181a-1181j of Title 43, if the disposal of such mineral or vegetative materials (1) is not otherwise expressly authorized by law, including, but not limited to, sections 315-315m, 315n, 315o-1, and 1171 of Title 43, and the United States mining laws, and (2) is not expressly prohibited by laws of the United States, and (3) would not be detrimental to the public interest.

d. Mining and Minerals Policy Act of 1970, (PL 91-631, 30 U.S.C. 21a, 84 Stat. 1876.) Sec. 2. The Congress declares that it is the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security and environmental needs, (3) mining, mineral, and metallurgical research, including the use and recycling of scrap to promote the wise and efficient use of our natural and reclaimable mineral resources, and (4) the study and development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined land, so as to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining or mineral activities.

For the purpose of this Act "minerals" shall include all minerals and mineral fuels including oil, gas, coal, oil shale and uranium.

e. Geothermal Steam Act of 1970 (PL 51-581, 30 U.S.C. 1001-1025, 84 Stat. 1566).

Sec. 3. Subject to the provisions of section 15 of this Act, the Secretary of the Interior may issue leases for the development and utilization of geothermal steam and associated geothermal resources (1) in lands administered by him, including public, withdrawn, and acquired lands.

Sec. 14. Subject to the other provisions of this Act, a lessee shall be entitled to use so much of the surface of the land covered by his geothermal lease as may be found by the Secretary to be necessary for the production, utilization, and conservation of geothermal resources.

Sec. 15. (a) Geothermal leases for lands withdrawn or acquired in aid of functions of the Department of the Interior may be issued only under such terms and conditions as the Secretary may prescribe to insure adequate utilization of the lands for the purposes for which they were withdrawn or acquired.

f. See Surface Mining and Reclamation Act (California), in Appendix.

C. Recreation

1. Description of Program Activity. The Recreation Program includes: The inventory, identification, and preservation of natural, historic, archaeological, and cultural values; the construction, operation and maintenance of recreation facilities; the management of visitors; and the control of recreation activities (1603.12C1).

2. Policy

a. FLPMA. Sec. 102(a)(8).

The public lands (shall) be managed in a manner that will provide for outdoor recreation and human occupancy and use.

3. Other Regulations

a. CFR Title 43, 6000.0-2, Objective.
The Bureau shall manage lands to promote public use and enjoyment of the lands for outdoor recreation use in a manner which will protect the health, safety, and comfort of the public and preserve and protect natural resources and values.

b. E.O. 11644, Use of Off-Road Vehicles on the Public Lands, (Feb. 9, 1972, 37 F.R. 2877).

Section 1. Purpose. It is the purpose of this order to establish policies and provide for procedures that will ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

c. CRF Title 43, 6010.4, Closure of Lands.

In the management of lands to protect the public and assure property resource utilization, conservation, and protection, public use and travel may be temporarily restricted. For instance, areas may be closed during periods of high fire danger or unsafe conditions, or where use will interfere with or delay mineral development, timber, and livestock operations, or other authorized use of lands. Areas may also be closed temporarily to:

(1) Protect the public health and safety.
(2) Prevent excessive erosion.
(3) Prevent unnecessary destruction of plant life and wildlife habitat.
(4) Protect the natural environment.
(5) Preserve areas having cultural or historical value.
(6) Protect scientific studies or preserve scientific values.

d. E.O. 11989, Off-Road Vehicles on Public Lands, (May 24, 1972, 42 F.R. 26959). (Amendment of E.O. 11644).

Section 9. Special Protection of the Public Lands. (a) Not-withstanding the provisions of Section 3 of this Order, the respective agency head shall, whenever he determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands, immediately close such areas or trails to the type of off-road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

(b) Each respective agency head is authorized to adopt the policy that portions of the public lands within his jurisdiction shall be closed to use by off-road vehicles except those areas or trails which are suitable and specifically designated as open to such use pursuant to Section 3 of this Order.

D. Visual Resource

1. Description of Program Activity.

The Bureau plans, designs, and implements its resource management in a manner which minimizes adverse effects on the visual resource (1603.36 B2, FY 78-82).

2. Policy. FLPMA 102(a)(8).

The Congress declares that it is the policy of the United States that the public lands be managed in a manner that will protect the quality of...scenic values....

3. Legislation.

a. Clean Air Act - Amendments (PL 95-95).

(1) Sec. 160(2) Preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value;

(2) Sec. 169A(a)(1). Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.

b. Mineral Leasing Act of 1920, Amendments 1973 (PL 93-153).

Sec. 28(h)(2)

The Secretary or agency head, prior to granting a right-of-way or permit pursuant to this section for a new project which may have a significant impact on the environment, shall require the applicant to submit a plan of construction, operation, and rehabilitation for such right-of-way or permit which shall comply with this section. The Secretary or agency head shall issue regulations or impose stipulations which shall include but shall not be limited to: (A) requirements for restoration, revegetation, and curtailment of erosion of the surface of the land; (B) requirements to insure that activities in connection with the right-of-way or permit will not violate applicable air and water quality standards nor related facility siting standards established by or pursuant to law.

c. See also: Clean Air Act as Amended, 1977, Secs. 160(2), and 169A and Surface Mining and Reclamation Act (California), 1975, in Appendix.

VI. Resource Programs

E. Wilderness

1. FLPMA-

Sec. 603. (a) Within fifteen years after the date of approval of this Act, the Secretary shall review those roadless areas of five thousand acres or more and roadless islands of the public lands, identified during the inventory required by section 201 (a) of this Act as having wilderness characteristics described in the Wilderness Act of September 3, 1964 (78 Stat. 890; 16 U.S.C. 1131 et seq.) and shall from time to time report to the President his recommendation as to the suitability or nonsuitability of each such area or island for preservation as wilderness: Provided, That prior to any recommendations for the designation of an area as wilderness the Secretary shall cause mineral surveys to be conducted by the Geological Survey and the Bureau of Mines to determine the mineral values, if any, that may be present in such areas: Provided further, That the Secretary shall report to the President by July 1, 1980, his recommendation(s) on those areas which the Secretary has prior to November 1, 1975, formally identified as natural or primitive areas. The review required by this subsection shall be conducted in accordance with the procedure specified in section 3(d) of the Wilderness Act.

(b) The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendations with respect to designation as wilderness of each such area, together with a map thereof and a definition of its boundaries. Such advice by the President shall be given within two years of the receipt of each report from the Secretary. A recommendation of the President for designation as widlerness shall become effective only if so provided by an Act of Congress.

(c) During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness, subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on the date of approval of this Act: Provided, That, in managing the public lands the Secretary shall by regulation or otherwise take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection. Unless previously withdrawn from appropriation under the mining laws, such lands shall continue to be subject to such appropriation during the period of review unless withdrawn by the Secretary under the procedures of Section 204 of this Act for reasons other than preservation of their wilderness character. Once an area has been designated for preservation as wilderness, the provisions of the Wilderness Act which apply to national forest wilderness areas shall apply with respect to the administration and use of such designated area, including mineral surveys required by section 4(d)(2) of the Wilderness Act, and mineral development, access, exchange of lands, and ingress and egress for mining claimants and occupants.

E. Wilderness

2. Wilderness Act of 1964, Sec. 2(c) (PL 88-577; 16 U.S.C. 1131, 78 Stat. 890).

   A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

F. Cultural Resources

1. Description of Program Activity (1603.36B1 FY 78-82)

   The Bureau manages and protects the cultural resources under its jurisdiction or control and avoids inadvertant loss or destruction of cultural resources.

   The Bureau recognizes that cultural resources are a fragile and nonrenewable resource with high educational, historic and scientific values.

2. Policy (FLPMA Sec. 102(a)(8)).

   The Congress declares that it is the policy of the United States that the public lands be managed in a manner that will protect the quality of . . . historical . . and archaeological values.

3. Legislation

   a. Antiquities Act of 1906 (PL 59-209; 16 U.S.C. 431-432, 34 Stat. 225).

      Sec. 2. That the President of the United States is hereby authorized, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments.

      Sec. 3. That permits for the examination of ruins, the excavation of archaeological sites, and the gathering of objects of antiquity upon the lands under their respective jurisdictions may be granted by the Secretaries of the Interior, Agriculture, and War to institutions which they may deem properly qualified to conduct such examination, excavation, or gathering, subject to such rules and regulations as they may prescribe:

b. Historic Sites Act, 1935 (16 U.S.C. 461 et seq., 49 Stat. 666)

It is declared that it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States (Sec. 461).

c. Reservoir Salvage Act of 1960, as amended (16 U.S.C. 469, 74 Stat. 220).

Sec. 469a-1. (a) Whenever any Federal agency finds, or is notified in writing, by an appropriate historical or archaeological authority, that its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archaeological data, such agency shall notify the Secretary in writing, and shall provide the Secretary with appropriate information concerning the project, program, or activity. Such agency may request the Secretary to undertake the recovery, protection, and preservation of such data (including preliminary survey, or other investigation as needed, and analysis and publication of the reports resulting from such investigation), or it may, with funds appropriated for such project, program, or activity, undertake such activities.

d. Historic Preservation Act of 1966, (PL 89-665; 16 U.S.C. 470, 80 Stat. 915).

The Congress finds and declares---
(a) that the spirit and direction of the Nation are founded upon and reflected in its historic past;
(b) that the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people;
(c) that, in the face of ever-increasing extensions of urban centers, highways, and residential, commercial, and industrial developments, the present governmental and nongovernmental historic preservation programs and activities are inadequate to insure future generations a genuine opportunity to appreciate and enjoy the rich heritage of our Nation; and
(d) that, although the major burdens of historic preservation have been borne and major efforts initiated by private agencies and individuals, and both should continue to play a vital role, it is nevertheless necessary and appropriate for the Federal Government to accelerate its historic preservation programs and activities, to give maximum encouragement to agencies and individuals undertaking preservation by private means, and to assist State and local governments and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities.

d. Historic Preservation Act of 1966 (cont.)

Sec. 101. (a) the Secretary of the Interior is authorized---(1) to expand and maintain a national register of district, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture, hereinafter referred to as the National Register, and to grant funds to States for the purpose of preparing comprehensive statewide historic surveys and plans, in accordance with criteria established by the Secretary, for the preservation, acquisition, and development of such properties;

Sec. 106. The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under title II of this Act a reasonable opportunity to comment with regard to such undertaking.

e. Executive Order No. 11593. Protection and Enhancement of the Cultural Environment (16 U.S.C. 470, 36 F.R. 8921).

Section 1. Policy. The Federal Government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. Agencies of the executive branch of the Government (hereinafter referred to as "Federal agencies") shall (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, (2) initiate measures necessary to direct their policies, plans and programs in such a way that federally owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored and maintained for the inspiration and benefit of the people, and (3), in consulation with the Advisory Council on Historic Preservation (16 U.S.C. 470i), institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural or archaeological significance.

f. See Native American Heritage Act, 1976 (State of California, Appendix).

G. Wildlife

1. Description of Program Activity. The Wildlife Program is primarily concerned with the protection and use of mammals, birds, reptiles, amphibians, fishes, and invertebrates through the enhancement and maintenance of their habitat components. The program activity is closely coordinated with State wildlife agencies (1603.12D).

2. Policy. FLPMA 102(a)(8).

Manage the public lands in a manner that will preserve and protect certain public lands in their natural condition and will provide food and habitat for fish and wildlife.

3. Legislation

a. Endangered Species Act of 1973 (PL 93-205, 16 U.S.C. 1531, 87 Stat. 884).

Sec. 2 (c) Policy. -- It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act.
Sec. 7. Interagency Cooperation - The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal departments and agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furthernace of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act and by taking such action necessary to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical.

b. Fish and Wildlife Coordination Act of 1958 (PL 85-624, 16 U.S.C. 661, 72 Stat. 563).

Sec. 2. The first four sections of the Act entitled "An Act to Promote the conservation of wildlife, fish, and game, and for other purposes", approved March 10, 1934 (16 U.S.C., secs. 661-664, inclusive) are amended to read as follows: "For the purposes of recognizing the vital contribution of our wildlife resources to the Nation, the increasing public interest and significance thereof due to expansion of our national economy and other factors, and to provide that wildlife conservation shall receive equal consideration and be coordinated with other features of water resource development programs through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation for the purposes of this Act in the United States, its Territories and possessions, the Secretary of the Interior is authorized (1) to provide assistance to, and cooperate with, Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife resources thereof, and their habitat, in controlling losses of the same from disease or other causes, in minimizing damages from overabundant species, in providing public shooting and fishing areas, including easements across public lands for access thereto, and in carrying out other measures necessary to effectuate the purposes of this Act.

Sec. 2(a) Except as hereafter stated in subsection (h) of this section, whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license, such department or agency first shall consult with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State . . .

c. Sikes Act, (PL 93-452, 16 U.S.C. 670a-o, 88 Stat. 1369).

Sec. 201(a) The Secretary of the Interior and the Secretary of Agriculture shall each, in cooperation with the State agencies and in accordance with comprehensive plans developed pursuant to section 202 of this title, plan, develop, maintain, and coordinate programs for the conservation and rehabilitation of wildlife, fish, and game. Such conservation and rehabilitation programs shall include, but not be limited to, specific habitat improvement projects and related activities and adequate protection for species considered threatened or endangered.

Sec. 202(a)(1) The Secretary of the Interior shall develop, in consultation with the State agencies, a comprehensive plan for conservation and rehabilitation programs to be implemented on public land under his jurisdiction and the Secretary of Agriculture shall do the same in connection with public land under his jurisdiction.

Sec. 202(c)(3) Each cooperative agreement entered into under this subsection shall--

(A) specify those areas of public land within the State on which conservation and rehabilitation programs will be implemented;
(B) provide for fish and wildlife habitat improvements or modifications, or both;
(C) provide for range rehabilitation where necessary for support of wildlife;
(D) provide adequate protection for fish and wildlife officially classified as threatened or endangered pursuant to section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533) or considered to be threatened, rare, or endangered by the State agency;
(E) require the control of off-road vehicle traffic;

d. Interagency Cooperation - Endangered Species Act of 1973, (50 CFR 402, Jan. 4, 1978, 43 F.R. 874).

Sec. 402.04. Consultation.

(a) Initation.

(1) It is the responsibility of each Federal agency to

review its activities or programs and to identify any such activity or program that may affect listed species or their habitat.

(3) When a Federal agency identifies activities or program(s) that may affect listed species or their habitat, the agency shall convey a written request for consultation with available information to: the Regional Director for the Region where the activity or program is or will be carried out:

(c) Assistance from the Service. It is the primary responsibility of each Federal agency requesting consultation to conduct the appropriate studies and to provide the biological information necessary for an adequate review of the effect an identified activity or program has upon listed species or their habitat.

(f) Further consultation. If the Director or Regional Director determines as a result of the threshold examination that insufficient information exists to conclude that an identified activity or program is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of its critical habitat, the Federal agency will be so notified in writing within 60 days after formal consultation is initiated. The Federal agency, with assistance as feasible from the Service and other sources of expertise, shall then obtain additional information and conduct, as appropriate, biological surveys or studies to determine how the activity or program may affect listed species or their critical habitat.

H. Soils, Air and Water

1. Description of Program Activity. The Watershed Program activity includes vegetative manipulation through mechanical, chemical, and biological methods, and water development and control structures. These are directed toward stabilization of soil resources, maintenance or restoration of soil productivity, protection and enhancement of water yield and quality, and reduction of flood and sediment damage, both on and off site (1603.12E1).

2. Policy

   a. FLPMA Sec. 102(a)(8)
   The Congress declares that it is the policy of the United States that the public lands be managed in a manner that will protect the quality of . . . air and atmosphere (and) water resource . . . values.

   b. E.O. 11752. Prevention, Control, and Abatement of Environmental Pollution at Federal Facilities, (Dec. 19, 1973, 38 F.R. 34793).

   Section 1 Policy. It is the purpose of this order to assure that the Federal Government, in the design, construction, management, operation, and maintenance of its facilities, shall provide leadership in the nationwide effort to protect and enhance the quality of our air, water, and land resources through compliance with applicable standards for the prevention, control, and abatement of environmental pollution in full cooperation with State and local governments.

Section 4. Standards.

(a) Heads of Federal agencies shall ensure that all facilities under their jurisdiction are designed, constructed, managed, operated, and maintained so as to conform to the following requirements:

(1) Federal, State, interstate, and local air quality standards and emission limitations adopted in accordance with or effective under the provisions of the Clean Air Act, as amended.

(2) Federal, State, interstate, and local water quality standards and effluent limitations respecting the discharge or runoff of pollutants adopted in accordance with or effective under the provisions of the Federal Water Pollution Control Act, as amended.

(3) Guidelines for solid waste recovery, collection, storage, separation and disposal systems issued by the Administrator pursuant to the Solid Waste Disposal Act, as amended.

3. Legislation

a. Soils (Watershed)

(1) Soil and Water Resources Conservation Act of 1977, (PL 95-192, 16 U.S.C 2001, 91 Stat. 1407).

Sec. 5(a) In recognition of the importance of and need for obtaining and maintaining information of the current status of soil, water, and related resources, the Secretary is authorized and directed to carry out a continuing appraisal of the soil, water, and related resources of the Nation. The appraisal shall include, but not be limited to--

(1) data on the quality and quantity of soil, water, and related resources, including fish and wildlife habitats;

(2) data on the capability and limitations of those resources for meeting current and projected demands on the resource base;

(3) data on the changes that have occurred in the status and condition of those resources resulting from various past uses, including the impact of farming technologies, techniques, and practices;

(4) data on current Federal and State laws, policies programs, rights, regulations, ownerships, and their trends and other considerations relating to the use, development, and conservation of soil, water, and related resources;

(5) data on the costs and benefits of alternative soil and water conservation practices; and

(6) data on alternative irrigation techniques regarding their costs, benefits, and impact on soil and water conservation, crop production, and environmental factors.

(b) The appraisal shall utilize data collected under this Act and pertinent data and information collected by the Department of Agriculture and other Federal, State, and local agencies and organizations.

(2) E.O. No. 11988. Floodplain Management (May 24, 1977, 42 F.R. 26951).

Sec. 2(c)

Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans and shall require land and water resources use appropriate to the degree of hazard involved. Agencies shall include adequate provision for the evaluation and consideration of flood hazards in the regulations and operating procedures for the licenses, permits, loan or grants-in-aid programs that they administer. Agencies shall also encourage and provide appropriate guidance to applicants to evaluate the effects of their proposals in flood plains prior to submitting applications for Federal licenses, permits, loans or grants.

Sec. 3(d) When property in floodplains is proposed for lease, easement, right-of-way, or disposal to non-federal public or private parties, the Federal agency shall (1) reference in the conveyance those uses that are restricted under identified Federal, State or local floodplain regulations; and (2) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successors, except where prohibited by law; or (3) withhold such properties from conveyance.

(3) Instruction Memo #CA-77-256 (California). BLM Policy on Conserving Rare, Threatened, or Endangered Plants on Public Lands in California

It is Bureau policy to conserve Federally and State-listed rare, threatened, or endangered plants and to utilize its authorities in furtherance of the purposes of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.) and similar state laws. The BLM, through its actions and/or decisions, will not jeopardize the continued existence of any Federally listed threatened or endangered plant, nor will it adversely modify the Critical Habitat (as determined by the FWS) of any such species.

The objectives of all programs will include the means to conserve officially listed plants, to promote their delisting, and/or to maintain or enhance the ecosystems occupied by plants on the CNPS inventory. BLM efforts on behalf of all such plants will be fully coordinated with the Area and Regional Offices of the FWS, appropriate offices of other Federal agencies, State agencies, local conservation organizations, and other appropriate groups or private citizens, particularly landowners with holdings adjacent to public lands where rare, threatened, or endangered plants occur.

b. Air

The Clean Air Act, as amended (PL 95-95, 42 U.S.C. 1857, 91 Stat. 685).

Sec. 118 (Control of Pollution from Federal Facilities) (a) Each department, agency, and instrumentality of executive, legislative, and judicial branches of the Federal Government (1) having jurisdiction over any property or facility, or (2) engaged in any activity resulting, or which may result, in the discharge of air pollutants, and each officer, agent, or employee thereof, shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of air pollution in the same manner, and to the same extent as any nongovernmental entity. The preceding sentence shall apply (A) to any requirement whether substantive or procedural (including any recordkeeping or reporting requirement, any requirement respecting permits and any other requirement whatsoever), (B) to the exercise of any Federal, State, or local administrative authority, and (C) to any process and sanction, whether enforced in Federal, State, or local courts or in any other manner. This subsection shall apply notwithstanding any immunity of such agencies, officers, agents, or employees under any law or rule of law. No officer, agent, or employee of the United States shall be personally liable for any civil penalty for which he is not otherwise liable.
(b) The President, may exempt any emission source of any department, agency, or instrumentality in the executive branch from compliance with such a requirement if he determines it to be in the paramount interest of the United States to do so, except that no exemption may be granted from section 111, and exemption from section 112 may be granted only in accordance with section 112(c).

Sec. 111 Standards of Performance for New Stationary Sources (e) After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source.

Sec. 110. Implementation Plans.

Each State shall, after reasonable notice and public hearings, adopt and submit to the Administrator, within nine months after the promulgation of a national primary ambient air quality standard (or any revision thereof) under section 109 for any air pollutant, a plan which provides for implementation, maintenance, and enforcement of such primary standard in each air quality control region (or portion thereof) within such State. See also Sec. 172. Appendix.

Part C.
Prevention of Significant Deterioration of Air Quality.

Sec. 162. Initial Classification.

(a) Upon the enactment of this part, all --
(1) international parks,
(2) national wilderness areas which exceed 5,000 acres in size,
(3) national memorial parks which exceed 5,000 acres in size, and
(4) national parks which exceed six thousand acres in size,
and which are in existence on the date of enactment of the Clear Air Act Amendments of 1977 shall be class I areas and may not be redesignated. All areas which were redesignated as class I under regulations promulgated before such date of enactment shall be class I areas which may be redesignated as provided in this part.

(b) All areas in such State identified pursuant to section 107(d)(1) (D) or (E) which are not established as class I under subsection (a) shall be class II areas unless redesignated under section 164.

Sec. 164 Area Redesignation.

(a) Except as otherwise provided under subsection (c), a State may redesignate such areas as it deems appropriate as class I areas. The following areas may be redesignated only as class I or II:

(1) an area which exceeds ten thousand acres in size and is a national monument, a national primitive area, a national preserve, a national recreation area, a national wild and scenic river, a national wildlife refuge, a national lakeshore or seashore, and

(2) a national park or national wilderness area established after the date of enactment of this Act which exceeds ten thousand acres in size.

Any area (other than an area referred to in paragraph (1) or (2) or an area established as class I under the first sentence of section 162(a)) may be redesignated by the State as class III if---

(A) such redesignation has been specifically approved by the Governor of the State, after consultation with the appropriate Committees of the legislature if it is in session or with the leadership of the legislature if it is not in session (unless State law provides that such redesignation must be specifically approved by State legislation) and if general purpose units of local government representing a majority of the residents of the area so redesignated enact legislation (including for such units of local government resolutions where appropriate) concuring in the State's redesignation;

(B) such redesignation will not cause, or contribute to, concentrations of any air pollutant which exceed any maximum allowable increase or maximum allowable concentration permitted under the classification of any other area; and

(C) such redesignation otherwise meets the requirements of this part.

c. Water

(1) Federal Water Pollution Control Act Amendments of 1972, (PL 92-500, 33 U.S.C. 1151, 86 Stat. 816).
Resume: (Section 208 directs that the Administrator of the Environmental Protection Agency shall promulgate comprehensive regulations intended to control water pollution sources, including non-point sources. Under the regulations which have been promulgated, the use of permits is required for any continuing pollution sources. The Federal land management agencies are instructed to implement the best possible management practices designed to prevent degradation of streams on the lands under their jurisdiction).

(2) Safe Drinking Water Act of 1974 (PL 93-523, 43 U.S.C.300f-300j, 88 Stat. 1660).
Sec. 300j-6. Each Federal agency having jurisdiction over any federally owned or maintained public water system shall comply with all national primary drinking water regulations in effect under section 1412, and each Federal agency shall comply with any applicable underground injection control program, and shall keep such records and submit such reports as may be required under such program.

d. Solid Waste. Resource Conservation and Recovery Act of 1976 (PL 94-580, 42 U.S.C. 6901, 90 Stat. 2795).

Sec. 6001. Each department, agency, and instrumentality of the executive, legislative, and judicial branches of the Federal Government (1) having jurisdiction over any solid waste management facility or disposal site, or (2) engaged in any activity resulting, or which may result, in the disposal of solid waste or hazardous waste shall be subject to, and comply with, all Federal, State, interstate, and local requirements for permits or reporting or any provisions for injunctive relief and such sanctions as may be imposed by a court to enforce such relief), respecting control and abatement of solid waste or hazardous waste disposal in the same manner, and to the same extent, as any person is subject to such requirements, including the payment of reasonable service charges. Neither the United States, nor any agent, employee, or officer thereof, shall be immune or exempt from any process or sanction of any State or Federal Court with respect to the enforcement of any such injunctive relief. The President may exempt any solid waste management facility of any department, agency, or instrumentality in the executive branch from compliance with such a requirement if he determines it to be in the paramount interest of the United States to do so. No such exemption shall be granted due to lack of appropriation unless the President shall have specifically requested such appropriation as a part of the budgetary process and the Congress shall have failed to make available such requested appropriation. Any exemption shall be for a period not in excess of one year, but additional exemptions may be granted for periods not to exceed one year upon the President's making a new determination. The President shall report each January to the Congress all exemptions from the requirements of this section granted during the preceding calendar year, together with his reason for granting each such exemption.

I. Range.

1. Description of Program Activity. The Range Management Program includes inventory, evaluation, and management of the range resource on public lands as used by domestic livestock and wild horses and burros. The program involves authroizing and supervising grazing use, developing and maintaining supporting livestock management facilities, and protecting the range from weed infestations, pests, and diseases (1603.12G1).

2. Policy. Manage the public lands in a manner that will provide food and habitat for domestic animals (FLPMA 102(a)(8)) and in a manner which recognizes the Nation's need for domestic sources of food from the public lands (FLPMA 102(a)(12).

3. Other legislation.

   a. Taylor Grazing Act, 1934 (43 U.S.C. 315)

      Sec. 315. That in order to promote the highest use of the public lands pending its final disposal, the Secretary of the Interior is authorized, in his discretion, by order to establish grazing districts or additions thereto and/or to modify the boundaries thereof, of vacant, unappropriated, and unreserved lands from any part of the public domain of the United States (exclusive of Alaska), which are not in national forests, national parks and monuments, Indian reservations, revested Oregon and California Railroad grant lands, or revested Coos Bay Wagon Road grant lands, which in his opinion are chiefly valuable for grazing and raising forage crops.

      Sec. 315a. The Secretary of the Interior shall make provisions for the protection, administration, regulation, and improvement of such grazing districts as may be created under the authority of section 315 of this title, and he shall make such rules and regulations and establish such service, enter into such cooperative agreements, and do any and all things necessary to accomplish the purposes of this subchapter and to insure the objects of such grazing districts, namely, to regulate their occupancy and use, to preserve the land and its resources from destruction or unnecessary injury, to provide for the orderly use, improvement, and development of the range; and the Secretary of the Interior is authorized to continue the study of erosion and flood control and to perform such work as may be necessary amply to protect and rehabilitate the areas subject to the provisions of this Act.

Sec. 315b. That nothing in this subchapter shall be construed or administered in any way to diminish or impair any right to the prossession and use of water for mining, agriculture, manufacturing, or other purposes which has heretofore vested or accrued under existing law validly affecting the public lands or which may be hereafter initiated or acquired and maintained in accordance with such law.

Sec. 315h. The Secretary of the Interior shall provide, by suitable rules and regulations, for cooperation with local associations of stockmen, State land officials, and official State agencies engaged in conservation or propagation of wildlife interested in the use of the grazing districts.

Sec. 315m. The Secretary of the Interior is further authorized, in his discretion, where vacant, unappropriated, and unreserved lands of the public domain are so situated as not to justify their inclusion in any grazing district to be established pursuant to this Act, to lease any such lands for grazing purposes, upon such terms and conditions as the Secretary may prescribe: PROVIDED, That preference shall be given to owners, homesteaders, lessees, or other lawful occupants of contiguous lands to the extent necessary to permit proper use of such contiguous lands, except that when such isolated or disconnected tracts embrace seven hundred and sixty acres or less, the owners, homesteaders, lessees, or other lawful occupants of lands contiguous thereto or concerning thereon shall have a preference right to lease the whole of such tract, during a period of ninety days after such tract is offered for lease, upon the terms and conditions prescribed by the Secretary: PROVIDED FURTHER, That when public lands are restored from a withdrawal, the Secretary may grant an appropriate preference right for a grazing lease, license, or permit to users of the land for grazing purposes immediately prior to the time of their restoration.

4. Amended Final Judgement, NATURAL RESOURCES DEFENSE COUNCIL, et al., v. CECIL D. ANDRUS, et al., April 14, 1978.

This matter originally came before the court on the cross-motions of plaintiffs, federal defendants, and defendants-intervenors for summary judgment. On December 30, 1974, this court issued its Memorandum Opinion and Judgment in which it granted plaintiffs' motion for summary judgment and denied those of the federal defendants and the defendants-intervenors. In that Judgment, the court determined, inter alia, that the federal defendants were required by Section 102(2) of the National Environmental Policy Act (NEPA), 42 U.S.C. 4321 et seq., to prepare environmental impact statements (EIS's) which discuss in detail the environmental effects of livestock grazing, and alternatives thereto, on specific areas of the public lands under the jurisdiction of the Bureau of Land Management (BLM) which are or will be authorized for such use. By agreement, dated April 11, 1975, plaintiffs and the federal defendants agreed upon a schedule for the preparation of the EIS's required by such order and on June 18, 1975, the court entered the Final Judgment (supplementing the Judgment of December 30, 1974) embodying the terms of that agreement.

Subsequently, the federal defendants proposed a material deviation in the agreed-upon schedule, and pursuant to paragraph 12 of the Final Judgment, filed herein a Notice of Proposed Deviation from Scheduled Preparation of EIS's on Livestock Grazing. Plaintiffs and the defendants-intervenors opposed the federal defendants' proposal. An evidentiary hearing was held on the proposed deviation and memoranda, affidavits and exhibits were filed by the parties. Upon review of these matters and good cause appearing therefore, it is, by this court, this 14th day of April, 1978,

HEREBY ORDERED, ADJUDGED and DECLARED that:

1. The Final Judgment of this court, entered June 18, 1975, is hereby amended and superseded. This amended Final Judgment is issued by the court as a means for full and complete compliance with the aforesaid Judgment of December 30, 1974.

2. The BLM shall cause to be prepared, publicly circulated, and considered in its decisionmaking process as required by law, EIS's concerning the environmental effects of livestock grazing activities (hereinafter defined) on the public lands of the United States described in paragraph 3, infra. Such EIS's shall comply with NEPA in all respects and shall be considered to be completed when filed with the Council on Environmental Quality and notice of the same is published in the Federal Register.

3. An EIS shall be completed for each of the 153 specific geographical areas of the public lands which the federal defendants have demarcated for such purpose. These areas, approximating 171,801,000 acres, are identified in Exhibit B to their Notice of Proposed Deviation filed herein on September 1, 1977.

4. A supplement to the final EIS on the Challis Planning Unit, Salmon District, Idaho (which was issued by the BLM on January 10, 1977) shall be completed by the end of Fiscal Year 1978. This supplement shall be prepared, circulated and considered in accordance with all requirements of NEPA.

5. All future EIS's, including the supplement to the Challis statement, shall be issued in accordance with the following schedule:

(a) in fiscal years 1978 and ~~1979~~ 1980, EIS's shall be prepared as specified by the federal defendants in Exhibit A to their Notice of Proposed Deviation;

(b) in fiscal years 1980 through 1982, the federal defendants shall prepare EIS's on public land acreages which total the respective, yearly acreages specified in the current EIS schedule for fiscal years 1979 through 1981. Within 90 days the federal defendants shall submit a plan to this court and the parties which specifies the particular areas to be covered during these years and the order in which they will be covered;

(c) during fiscal years 1983 through and including 1988, all of the EIS's remaining to be prepared shall be completed and they shall be completed at a yearly rate of at least 14% of the total, cumulative minimum, and provided further, that notice of land descriptions and the number of EIS's to be completed each year, beginning in 1982, shall be published in the Federal Register at least 60 days prior to the beginning of each such year.

6. Each EIS contemplated by this Order shall discuss in detail "livestock grazing activities" and all reasonable alternatives thereto. "Livestock grazing activities" as used in this Order shall mean all existing or proposed livestock grazing, all grazing use authorizations issued or contemplated to be issued by the BLM as well as those substantial activities which are supportive of and related to livestock grazing administered by the BLM, such as fencing, livestock water development, spraying, chaining, seeding, and brush removal. The procedures and methodology for the preparation of EIS's as specified in this subparagraph, are by this court's order to be left for initial determination by the federal defendants.

7. The BLM shall not implement any Allotment Management Plan (AMP) or its equivalent prior to the completion of an EIS covering such AMP, and, further, until an appropriate EIS is completed, the BLM and the federal defendants shall adhere to the current policy of limiting authorizations for livestock grazing on any given area to an annual authorization basis, to the extent allowed by law.

8. If the federal defendants, in good faith, believe the circumstances require deviations from the EIS completion schedule and procedures as contemplated by this Order, such deviations can be made by the BLM if they are "immaterial deviations", as defined hereinafter; provided that, notwithstanding that the federal defendants need not seek from the court or the plaintiffs consent or approval to make immaterial deviations, the BLM shall nonetheless advise the plaintiffs in writing of such deviations as they occur.

9. If the federal defendants believe, in good faith, that circumstances dictate that any material deviations must be made, then in that event, the federal defendants shall give Notice to this court wherein a detailed explanation shall be made of the deviation which is anticipated to occur together with the reasons therefore. This Notice shall be filed prior to the anticipated implementation of such deviation, and contemporaneously a copy of such Notice shall be sent by registered mail to all parties to this action (No. 1983-73) and such Notice shall be published in the Federal Register. Thereafter, if objections are filed with the court within 30 days from the date of publication in the Federal Register, the federal defendants and the objecting parties may make such motions and present evidence to the court as to them seems proper, and the court shall determine if such deviations shall be allowed to occur or make any other appropriate order; provided, however, that if no objections are filed with the court within such 30 day period, the BLM shall be authorized to implement such deviation.

10. The term "immaterial deviation" for the purpose of this Order shall mean any change or deviation from the terms and conditions of this Order which have any of the following effects:

(1) To reduce the number of acres to be covered by EIS's during any of the first five years as described in subparagraphs 5a and 5b, supra, by less than 10,000,000 acres cumulatively, but provided that such reduction shall include not more than 2,000,000 acres in any one year.

(2) To reduce the number of EIS's to be completed during any of the first five years as described in subparagraphs 5a and 5b, supra, by less than 3 EIS's cumulatively, but provided that such reduction shall include not more than 1 EIS in any one year, and further provide that any EIS's scheduled for completion during the first five years which remain to be completed at the close of that period will be completed in the succeeding year.

(3) To reduce the number of EIS's scheduled for completion during the years after the first five years by 2 or less in any one year; but provided that any EIS's remaining to be completed at the end of FY 1988 will by completed in the succeeding year.

11. This Order shall in no way foreclose or affect any contentions, claims or rights of judicial review which plaintiffs may have concerning the compliance with NEPA, in any respect, of any given EIS completed pursuant to this order. IT IS SO ORDERED.

J. Wild Horses and Burros.

Wild Horse and Burro Act. (PL 92-145, 16 U.S.C. 1331 85 Stat. 649)

Congress finds and declares that wild free-roaming horses and burros are living symbols of the historic and pioneer spirit of the West; that they contribute to the diversity of life forms within the Nation and enrich the lives of the American people; and that these horses and burros are fast disappearing from the American scene. It is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands.

Enforcement Provisions. 43 CFR 4700, Part 4760.

The Director of the Bureau of Land Management may authorize such employees as he deems necessary to arrest without warrant, any person committing in the presence of the employee a violation of the Act or of these regulations and to take such person immediately for examination or trial before an officer or court of competent jurisdiction. Any employee so designated shall have power to execute any warrant or other process issued by an officer or court of competent jurisdiction to enforce the provisions of the Act or these regulations.

VI Resource Programs

C. Recreation

3. Other Regulations

e. Environmental Education, 20 U.S.C. 1531

(a) The Congress of the United States finds that the deterioration of the quality of the Nation's environment and of its ecological balance poses a serious threat to the strength and vitality of the people of the Nation and is in part due to poor understanding of the Nation's environment and of the need for ecological balance; that presently there do not exist adequate resources for educating and informing citizens in these areas, and that concerted efforts in educating citizens in these areas, and that concerted efforts in educating citizens about environmental quality and ecological balance are therefore necessary.

(b) It is the purpose of this chapter to encourage and support the development of new and improved curricula to encourage understanding of policies, and support of activities designed to enhance environmental quality and maintain ecological balance while giving due consideration to the economic considerations related thereto.

F. Cultural Resources

3. Legislation

g. American Indian Religious Freedom, (PL 95-341).

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled. That henceforth it shall be the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

I. Range

3. Other Legislation

b. Public Rangelands Improvement Act of 1978, (43 U.S.C. 1901)

Sec. 2. (a) The Congress finds and declares that—

(1) vast segments of the public rangelands are producing less than their potential for livestock, wildlife habitat, recreation, forage, and water and soil conservation benefits; and for that reason are in an unsatisfactory condition;

(2) such rangelands will remain in an unsatisfactory condition and some areas may decline further under present levels of, and funding for management;

(3) unsatisfactory conditions on public rangelands present a high risk of soil loss, desertification, and a resultant underproductivity for large acreages of the public lands; contribute significantly to unacceptable levels of siltation and salinity in major western watersheds including the Colorado River; negatively impact the quality and availability of scarce western water supplies; threaten important and frequently critical fish and wildlife habitat; prevent expansion of the forage resource and resulting benefits to livestock and wildlife production; increase surface runoff and flood danger; reduce the value of such lands for recreational and esthetic purposes; and may ultimately lead to unpredictable and undesireable long-term local and regional climatic and economic changes;

(4) the above-mentioned conditions can be addressed and corrected by an intensive public rangelands maintenance, management, and improvement program involving significant increases in levels of rangeland management and improvement funding for multiple-use values;

(5) to prevent economic disruption and harm to the western livestock industry, it is in the public interest to charge a fee for livestock grazing permits and leases on the public lands which is based on a formula reflecting annual changes in the costs of production

(b) The Congress therefore hereby establishes and reaffirms a national policy and commitment to:

(1) inventory and identify current public rangelands conditions and trends as a part of the inventory process required by section 201(a) of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1711);

(2) manage, maintain and improve the condition of the public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process established pursuant to section 202 of the Federal Land Policy and Management Act (43 U.S.C. 1712);

G. Wildlife

3. Legislation

a. Endangered Species Act of 1973 (16 U.S.C. 1531).

Sec. 7. Interagency Cooperation

Add: Instruction Memo #CA-78-225 (California) Sept. 1, 1978. Solicitor's Opinions and the Fish and Wildlife Service Policy Concerning Endangered Species Act Section 7 Consultation:

Enclosure 1 is the FWS policy on section 7 consultations concerning proposed threatened or endangered species. This policy is of particular importance in light of the FWS proposal to list 1,700 plants as endangered. Basically, the mandatory consultation requirements of the section 7 regulations do not apply to Federal agency activities which may affect proposed endangered or considered to be in the best interests of both the species and the agencies in such cases. The unique status of proposed species must be recognized in order to avoid later conflicts under section 7. Thus, the FWS policy is to encourage voluntary and informal consultation concerning conflicts with proposed endangered threatened species.

e. E.O. 11990. Protection of Wetlands. (May 24, 1977)

Section 1. (a). Each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

Section 4. When Federally-owned wetlands or portions of wetlands are proposed for lease, easement, right-of-way or disposal to non-Federal public or private parties, the Federal agency shall (a) reference in the conveyance those uses that are restricted under identified Federal, State or local wetlands regulations; and (b) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successor, except where prohibited by law; or (c) withhold such properties from disposal.

(3) charge a fee for public grazing use which is equitable and reflects the concerns addressed in paragraph(a)(5) above;

Section 4(a) Following enactment of this Act, the Secretary of the Interior and the Secretary of Agriculture shall update, develop (where necessary) and maintain on a continuing basis thereafter, an inventory of range conditions and record of trends of range conditions on the public rangelands, and shall categorize or identify such lands on the basis of the range conditions and trends thereof as they deem appropriate. Such inventories shall be conducted and maintained by the Secretary as a part of the inventory process required by section 201(a) of the Federal Land Policy and Management Act . . . and shall be kept current on a regular basis so as to reflect changes in range conditions; and shall be available to the public.

(b) The Secretary shall manage the public rangelands in accordance with the Taylor Grazing Act (43 U.S.C. 315-315(o), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701-1782), and other applicable law consistent with the public rangelands improvement program pursuant to this Act.

J. Wild Horses and Burros.

Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901)

Sec. 2(a) The Congress finds and declares that—
(6) the Act of December 15, 1971 (85 Stat. 649, U.S.C. 1331 et seq.), continues to be successful in its goal of protecting wild free-roaming horses and burros from capture, branding, harrassment, and death, but that certain amendments are necessary thereto to avoid excessive costs in the administration of the Act, and to facilitate the humane adoption or disposal of excess wild free-roaming horses and burros which because they exceed the carrying capacity of the range, pose a threat to their own habitat, fish, wildlife, recreation, water and soil conservation, domestic livestock grazing, and other rangeland values;

Sec. 2(b) The Congress hereby establishes and reaffirms a national policy and commitment to:
(4) continue the policy of protecting wild free-roaming horses and burros from capture, branding, harassment, or death, while at the same time facilitating the removal and disposal of excess wild free-roaming horses and burros which pose a threat to themselves and their habitat and to other rangeland values;

Sec. 14 (a) Subsections 3(b), (c), and (d) of the Act of December 15, 1971 (85 Stat. 649; 16 U.S.C. 1333(b) (3)) are hereby amended to read as follows:

"(b)(1) The Secretary shall maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands. The purpose of such inventory shall be to: make determinations as to whether and where an overpopulation exists and whether action should be taken to remove excess animals;

A new subsection (f) is added to section 2 of the Act of December 15, 1971, as amended (16 U.S.C. 1332) to read as follows:

"(f) 'excess animals' mean wild free-roaming horses or burros (1) which have been removed from an area by the Secretary pursuant to applicable law or, (2) which must be removed from an area in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area."

Appendix 2

Livestock Grazing Management Practices and Future Expectations/ Vegetation Production and Forage Allocation

The following eight fold-out tables may be inspected with the aid of legends contained on each table. For order of presentation, these tables provide information on:

a) Management Practices and Future Expectations on Current Allotments - Protection Alternative

b) Management Practices and Future Expectations on Current Allotments - Balanced Alternative

c) Management Practices and Future Expectations on Current Allotments - Use Alternative

d) Vegetative Production and Forage Allocation on Current Allotments - Protection Alternative

e) Vegetative Production and Forage Allocation on Current Allotments - Balanced Alternative

f) Vetetative Pproduction and Forage Allocation on Current Allotments - Use Alternative

g) Management Practices Prescribed on Proposed Allotments - Protection/Balanced/Use Alternatives

h) Vegetative Production and Forage Allocations on Proposed Allotments - Protection/Balanced/Use Alternatives.

MANAGEMENT PRACTICES PRESCRIBED

● PROTECTION ALTERNATIVE ●

Allotments		Acres				① Range Type Classified		②	③	Prescribed Management Practices			⑦ REGULATIONS FOR CONCENTRATION AREAS		⑧	Prescribed New Range Improvements: WATER SOURCE DEVELOPMENT			WATER DISTRIBUTION		FENCING		⑨	Multiple Use Class Distribution (% OF ALLOTMENT)			
MAP NUMBER	NAME (BLM NUMBER)	PUBLIC	PRIVATE and MILITARY EXCHANGE OF USE	TOTAL	OTHER	Existing	Proposed	Type of AMP	Season of Use	④ Forage Readiness	⑤ Maximum Allowable Utilization	⑥ Monitoring and Adjustment	Watering	Handling	Ear Tags	Springs	Wells	Catch-ments	Pipeline (miles)	Troughs	Boundary (miles)	Pasture (miles)	Future Expect-ations	C	L	M	I
1	FISHLAKE VALLEY (6003)	1,482	0	1,482	0	PER	PER	N	SP, SM	Green-Up	A	1	W-2		N								9 %		100		
2	BAR 99 (6001)	13,671	0	13,671	0	PER	PER	M	SP, F	Green-Up	A	2, 5, B	W-2		N		1		1				+ 5 %		100		
3	DEEP SPRINGS (6005)	43,028	0	43,028	0	PER	PER	M	W, SP	Dormant	A	3, 5, B	W-2		N	1	1		4	3		6	+ 5 %	30	70		
4	LAST CHANCE (6004)	94,711	0	94,711	0	PER	EPH/PER	N Y	Y	200 lbs	A, B	3, 5, B	W-2		Y								+10 %	70	30		
5	OASIS RANCH (6000)	22,894	0	22,894	0	PER	PER	N	F, W, SP	Dormant	A	2, 5, B	W-2		N								0 %	100			
6	SOUTH OASIS (6006)	10,884	0	10,884	0	PER	PER	N	SP, F	Green-Up	A	2, %, B	W-2		N								+10 %	55	45		
7	DARWIN (5010)	1,928	0	1,928	0	PER	PER	N	W	Dormant	A	1, 5, B	W-2		N						1		+10 %		100		
8	HUNTER MTN (5013)	55,210	0	55,210	0	PER	PER	N	W, SP	Dormant	A	3, 5, B	W-2		N	3			1	2		4	0 %	50	50		
9	LACY-CACTUC-McCLOUD (6012)	36,560	382,000	418,560	0	PER	PER	I	W, SP	Dormant	A	3, 5, B	W-2		N	3	1	3	18	6		10	+ 1 %		40		60
10	OLANCHA COMMON (6011)	14,540	0	14,540	0	PER	PER	N	SP	Green-Up	A	1, 5, B	W-2		N								0 %		100		
11	TUNAWEE COMMON (5009)	30,016	12,864	42,880	0	PER	PER	M	SP	Green-Up	A	2, 5, AB	W-2	H-1,3	N		2		3	7	3		0 %	35	35		30
12	ANTELOPE VALLEY (5004)	6,500	0	6,500	0	PER	EPH	N	SP	200 lbs	B	4, 5, A	W-1	H-1,3	N										N/A		
13	BISSEL (5001)	4,002	0	4,002	0	EPH	EPH	N	SP	200 lbs	B	4, 5, A	W-1	H-1,3	N										N/A		
14	CANTIL COMMON (5005)	364,800	43,000	407,800	0	EPH	EPH	M	SP	200 lbs	B, C	3, 5, A	W-1	H-2,3	N		5							10	80	10	
15	MONOLITH CANTIL (5007)	23,043	26,883	49,926	0	EPH	EPH	M	SP	200 lbs	B, C	3, 5, A	W-1	H-2,3	N										100		
16	OAK CREEK (5015)	160	0	160	0	PER	EPH/PER	N	SP	200 lbs	A	5	W-2	H-1,3	N										N/A		
17	RUDNICK COMMON (5008)	163,973	39,000	202,973	0	PER	EPH/PER	I	Y	200 lbs	A, B	3, 5, AB	W-2	H-3	Y	8	2	2	4	7		30	0 %	18	82		
18	WARREN (5002)	584	0	584	0	PER	EPH/PER	N	SP	200 lbs	B	5	W-2	H-1,3	N										N/A		
19	WALKER PASS (0077)	75,000	0	75,000	0	PER	EPH/PER	M	W, SP	200 lbs	A, B	2, 4, 5, B	W-2		Y		1		1	3		5	+ 5 %	85	15		
20	PAHRUMP VALLEY (5000)	12,286	0	12,286	0	PER	EPH/PER	N	SP, SM	200 lbs	A, B	1, 5, B	W-2		N								0 %	100			
21	HANSON (5006)	32,000	32,000	64,000	0	PER	EPH/PER	M	SP, SM, F	200 lbs	A, B	1, 4, 5, AB	W-2	H-1	N								0 %	50	50		
22	BORON SHEEP (7114)	4,714	2,768	7,482	0	EPH	EPH	N	SP	200 lbs	C	2, 4, 5, A	W-1	H-1,3	N										N/A		
23	BUCKHORN CYN (7103)	16,791	4,463	21,254	0	EPH	EPH	N	SP	200 lbs	C	2, 4, 5, A	W-1	H-1,3	N		1								100		
24	GOLDSTONE (7104)	9,006	0	9,006	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1	N		1									100	
25	GRANITE MTNS (7105)	5,714	0	5,714	0	EPH	EPH	M	Y	200 lbs	B	2, 4, 5, A	W-2		N		1								100		
26	GRAVEL HILLS (7107)	65,598	63,025	128,623	0	EPH	EPH	N	SP	200 lbs	B, C	3, 4, 5, A	W-1	H-1,2,3	N		2								100		
27	HARPER LAKE (7119)	12,859	676	13,535	0	EPH	EPH/PER	M	Y	200 lbs	A, B, C	3, 4, 5, B	W-2		N		2	1		6	4		+ 5 %		100		
28	LAVA MTNS (7108)	16,830	0	16,830	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1,3	N									100			
29	PILOT KNOB (7106)	49,150	49,151	98,303	0	EPH	EPH	M	SP, SM, F	200 lbs	A, B	3, 4, 5, A	W-2		N	2	1		1	6				15	15	20	50
30	SHADOW MTNS (7113)	36,583	5,955	42,538	0	EPH	EPH	N	SP	200 lbs	B, C	2, 4, 5, A	W-1	H-1,2,3	N		1								100		
31	SPANGLER HILLS (7112)	66,899	0	66,899	440	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1	H-1,2	N		1								100		
32	STODDARD MTN (7114)	170,126	99,915	270,041	0	EPH	EPH	N	SP	200 lbs	B, C	3, 4, 5, A	W-1	H-1,2,3	N		1								100		
33	SUPERIOR VALLEY (7116)	167,648	29,584	197,232	0	EPH	EPH	N	SP	200 lbs	B, C	3, 4, 5, A	W-1	H-1,2,3	N		1								50	50	
34	VALLEY WELL (7117)	640	0	640	0	PER	EPH/PER	N	Y	200 lbs	A, B	3, 4, 5, B	W-2		N								0 %		100		
35	NEWBERRY/ORD (6218)	24,049	11,317	35,366	0	EPH	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	2	1	2		4	20		+10 %	10	90		
36	RATTLESNAKE CYN (7111)	20,475	0	20,475	1,960	PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N		1			2	3		0 %	90	10		
37	WHITEWATER CYN (7118)	26,878	15,333	42,211	0	PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	3	2	2	4	6			0 %	20	80		
38	AFTON CYN (7215)	41,825	41,825	83,650	0	EPH	EPH	N	Y	200 lbs	B	2, 4, 5, A	W-2		Y		1	3		1	20			25	75		
39	CLARK MTN (7203)	71,359	4,300	75,659	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B, C	3, 4, 5, AB	W-2		Y	2	3	1	5	12	8		†10 %	5	95		
40	COLTON HILLS (7202)	143,888	43,800	187,688	53,310	EPHP/ER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y		2	1	10	3		20	5 %	†5	75		
41	CRESCENT PEAK (7213)	31,201	0	31,201	383	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y		1		2	1			0 %	90	10		
42	CRONESE LAKE (7219)	51,000	12,750	63,750	0	EPH	EPH	N	Y	200 lbs	B	2, 4, 5, A	W-2		Y									95	5		
43	GRANITE MTN (7211)	276,175	48,686	324,861	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	1					5		5 %	85	15		
44	GOLD VALLEY (7212)	15,865	1,721	17,586	0	EPH/PER	EPH/PER	R	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	2	2	1	5	4	2		+ 5 %		100		
45	HORSETHIEF SPGS (7207)	108,793	0	108,793	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	1	2		13	5			0 %	50	40	10	
46	KESSLER SPGS (7208)	233,872	19,346	253,218	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y	2	2	1	4	4			0 %	30	70		
47	LANFAIR VALLEY (7210)	339,553	127,641	467,194	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y				8	4			0 %	50	50		
48	PIUTE VALLEY (7204)	33,468	4,810	38,278	0	EPH	EPH	N	SP, F	200 lbs	A, B, C	1, 4, 5, A	W02		Y				3	2			0 %	40	60		
49	ROUND VALLEY (7216)	670	3,530	4,200	0	EPH/PER	EPH/PER	N	Y	200 lbs	A, B	3, 4, 5, B	W-2		Y							1	0 %	20	20		60
50	VALLEY VIEW (7200)	271,506	17,530	289,036	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y	3	2	1	5	4			0 %	35	65		
51	VALLEY WELLS (7209)	237,258	5,970	243,228	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B, C	3, 4, 5, AB	W-2		Y	2	1		5	4			0 %	50	50		
52	FORD DRY LAKE (7044)	19,089	0	19,089	0	EPH	EPH	N	SP, W, F	200 lbs	B	3, 4, 5, A	W-1	H-1	N		1	1						50	50		
53	JEAN LAKE (7217)	5,740	0	5,740	0	EPH/PER	EPH/PER	N	Y	200 lbs	A, B, C	1, 4, 5, AB	W-2		Y								0 %		100		
54	LAZY DAISY (7220)	451,617	92,181	543,798	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B, C	3, 4, 5, AB	W-2		Y	2	1		8	4	6		+10 %	70	30		
55	SHEEP DRIVEWAY	23,040	0	23,040	0	EPH	EPH	N	SP' SM	200 lbs	B		W-1	H-2,3	N												
	Total	405, 178	1, 242, 024	5, 299, 172												36	47	19	105	100	72	76					

⑩ Decision Criteria	⑪ Data Sources
A,B,G	B-1, E-2, F
A,B,E,I-2, G	B-1, C-3, E-2, F
A,B,C-2,%3, E,G	B-1, C-3, E-2, F
A,B,C-2, E,G,I-2	B-2, C-3, E-1/2, F
A,B,C-2, E,G	F
A,B,E	F
A,B,D,E	A-3, B-1, D-3, E-2, F
A,B,C-2,G,D,E	F
A,B,C-2, D,E,I-1	A-3, B-1/3, D-1, E-1%2, F
A,B, C-2	A-3, B-1, D-2, E-2, F
A,B, C-2, E, I-1	A-1/3, B-1, D-2, E-1/2, F
A,F, I-3	B-1, C-3, E-2, F
A,C,F, I-3	B-1, E-2, F
A, B, C-1, H, I-3	A-2,B-1,C-2/3,D-1/2,E-1/2,F
A,B, C-1, I-3	A-2, B-1, D-2, E-2, F
A,F, I-3	B-1, E-2, F
A,B, C-3, G, I	A-2/4,B-1,C-2,D-2,E-1/2,
A,F, I-3	B-1, E-2, F
A,B, C-2, I-2	A-2, B-1, C-2, D-2, E-1/2, F
A,B, I-2/3	F
A,B,C-2/3, G, I-3	A-2, B-1, C-2, E-1/2, F
A, C-1, F, I-3, G	A-2, B-1, C-1/3, E-2, F
A, C-1, I-3, G	B-1, C-1, E-2, F
A, C-1, F,H,G	B-1, C-1, E-2, F
A,G	B-1, E-2, F
A, C-1, I-3, G	A-2, B-1, C-1, E-1/2, F
A, C-1, H,G	A-1, B-1, C-1/3, E-2, F
A,B,G	A-2, B-1, E-2, F
A,B,C-1,D,H,I-1,G	A-2, B-1, C-1/3, E-2, F
A, C-1, I-3, G	B-1, E-2, F
A, C-1, H	A-2, B-1, E-2, F
A, C-1, H, I-3	B-1, C-1/3, E-1/2, F
A,B,C-1, H, I-3, G	A-2, B-1, C-2, E-1/2, F
A,G	B-1, C-1, E-2, F
A,B,G	A-5, B-1, C-1/3, E-1/2, F
A,B,G	B-1, C-1/3, E-2, F
A,B, C-1, D,H,I-3,G	B-1, C-1/3, E-2, F
A,B,C-2/3, H,G	B-1, C-3, E-1/2, F
A,B,C-1/2/3, D,E,H	B-1/2, C-1/3, E-2, F
A,B,C-1/2/3, D,E	A-1/6,B-1/2,C-1/3,D-1,E-1/2,F
A,B, C-1/2/3, I-2	A-1,B-1/2, C-1/3,E-1/2, F
A,B,G	B-1, C-3, E-1/2, F
A,B, C-2/3, D,E,H	A-1/6,B-1/2,C-1,E-1/2, F
A,C-2,/3, D,E	A-1/6,B-1/2/4,C-3,E-2,F
A,B, C-2/3, H,G	B-1/2, C-1/3, E-2/4, F
A,B, C-1/2, D,E	A-1/6,B-1/2,C-1/3,E-1/2, F
A,B,C-1/2/3,D,E,H,I-3	A-1/6,B-1/2, C-1/3,E-1/2, F
A,B, C-1, D,E,H	A-1, B-1, C-1, E-2, F
A,B	A-1, B-1, C-1/3, E-2, F
A,B, C-1/2/3, D,E,H	A-1/6,B-1/2,C-1/3,D-2,E-1/2
A,B,C-1/2/3, D,E,H	B-1/2, C-1/3, E-2, F
A,B,H,G	B-1, E-2, F
A, C-1, I-2, G	B-1, C-1, E-2, F
A,B, C-1/2/3, H	B-1, C-1, E-2/4/5, F
N/A	N/A

MANAGEMENT PRACTICES PRESCRIBED

① RANGE TYPE.
PER = Perennial
EPH = Ephemeral

② TYPE AMP (Allotment Management Plan):
I = INTENSIVE:
Strict and detailed schedule of defferred rotational systems
M = MDDERATE:
Management system imposed, but does not include strict rotational system
N = NDN-INTENSIVE:
No psture restriction other than distribution of livestock according to availability of forage and water
R = INTENSIVE:
Strict and detailed schedule of rest-rotational systems

③ SEASDN DF USE:
SP = Spring
SM = Summer
F = Winter
W = Year-round

④ FDRAGE READINESS-
This will be judged on the basis of forage plant phenology and will be employed for determining turnout dates and pasture shifts
Green Up = Early flowering of key species
Dormant = Plant growth generally inactive
200 lbs = When 200 lbs of dry weight production of ephemerals is present or reasonably anticipated on selected sites

⑤ MAXIMUM ALLDWABLE UTILIZATION DF KEY SPECIES:
A = 40 - 50% use of new growth of key forage species
B = 50% use of ephemeral production and depletion of supporting soil moisture
C = 25% use of ephemeral production and depletion of soil moisture

⑥ MONITDRING AND ADJUSTMENTS.
Monitoring.
1) Transects or utilization plots
2) Transect and utilization plos
3) Transect and utilization plots and exclosures
4) Annual production plots
5) Livestock monitoring or actual use

Adjustments.
A) Stocking rates determined each growing year
B) Every fifth year, permanent plot data for perennial plant cover (transects and exclosures) will be reviewed to determine if adjustments in the yearly stocking rate formuals are needed to achieve desired production on a sustained yield basis
C) Evaluation of all trend and condition plot data after each grazing cycle. Modify grazing program when needed to meet condition, trend, and production objectives

⑦ WATERING AND HANDLING:
Watering.
W1) Non-permanent; designated critical areas to be avoided
W2) Permanent designated areas
Handling.
H1) Dpen herding
H2) 1 mile buffer - roadways designated annually
H3) Designated areas for loading and unloading

⑧ EAR TAGS:
The use of ear tagging may be needed for some allotments
N) Ear tagging will not occur
Y) Ear tagging will occur

⑨ ESTIMATED PERCENT INCREASE AVAILABLE PERENNIAL FORAGE ALLDCATIDNS FOR LIVESTOCK

⑩ DECISIDN CRITERA:
These are the major factors influencing grazing allotment decisions
A = Forage production surveys
B = Multiple use class designations - primarily Class C
C = Wildlife requirements:
1) Tortoise
2) Big game
3) Listed and Sensitive Species
D = Burro populations (and wild horse)
E = Burro and Wild Horse Management prescriptions
F = Land Tenure Adjustments
G = Future economic projection
H = Areas of Critical Environmental Concern (ACEC)
I = Boundary considerations:
1) Dther agencies (NPS, FS, DOD)
2) CDCA boundaries (allotment extends outside the CDCA)
3) Extensive private land adjacent to public lands

⑪ DATA SDURCES USED TD PRDDUCE THE RANGE ELEMENT CHARTS:
A = Vegetation and Range Surveys.
1) URA-MFP East Mojave 1976
2) URA-MFP El Paso/Red Mtn 1975
3) Adjudication COSD 1966
4) Rudnick Survey 1970
5) Ord Mtn Survey 1977
6) East Mojave Range Survey 1969
B = Allotment files:
1) Actusl use records
2) Trend plots for East Mojave
3) Trend plots for Naval Weapons Center
4) AMP Southcott
C = Special reports and interviews.
1) Allotment review - Riverside District 1979
2) Allotment review - Bakersfield District 1979
3) UC Extension Service questionnaire 1979
D = Comparison areas:
1) Exclosure
2) Highway right-of-way
3) Relic areas (little grazed)
E = CDCA Inventory:
1) Large scale aerial transects
2) Satellite spectral class designations
3) Lucerne Valley vegetative survey 1978
4) Kingston Mtns vegetative survey 1978
5) Turtle Mtns vegetative survey 1978
F = Professional observations and evaluations

MANAGEMENT PRACTICES PRESCRIBED

● BALANCED ALTERNATIVE ●

Allotments		Acres				❶ Range Type Classified		Prescribed Management Practices								Prescribed New Range Improvements							❾ Future Expectations	Multiple Use Class Distribution			
								❷	❸	❹	❺	❻	❼ REGULATIONS FOR CONCENTRATION AREAS		❽	WATER SOURCE DEVELOPMENT			WATER DISTRIBUTION		FENCING			(% OF ALLOTMENT)			
MAP NUMBER	NAME (BLM NUMBER)	PUBLIC	PRIVATE and MILITARY EXCHANGE OF USE	TOTAL	OTHER	Existing	Proposed	Type of AMP	Season of Use	Forage Readiness	Maximum Allowable Utilization	Monitoring and Adjustment	Watering	Handling	Ear Tags	Springs	Wells	Catch-ments	Pipeline (miles)	Troughs	Boundary (miles)	Pasture (miles)		C	L	M	I
1	FISHLAKE VALLEY (6003)	1,482	0	1,482	0	PER	PER	N	SP, SM	Green-Up	A	1	W-2		N								0 %		100		
2	BAR 99 (6001)	13,671	0	13,671	0	PER	PER	M	SP, F	Green-Up	A	2, 5, B	W-2		N		1		1				+ 5 %		100		
3	DEEP SPRINGS (6005)	43,028	0	43,028	0	PER	PER	I	W, SP	Dormant	A	3, 5, B	W-2		N	1	1		6	4		6	+10 %		100		
4	LAST CHANCE (6004)	94,711	0	94,711	0	PER	EPH/PER	NY	Y	200 lbs	A, B	3, 5, B	W-2		Y								+20 %		100		
5	OASIS RANCH (6000)	22,894	0	22,894	0	PER	PER	N	F, W, SP	Dormant	A	2, 5, B	W-2		N								+10 %		100		
6	SOUTH OASIS (6006)	10,884	0	10,884	0	PER	PER	N	SP, F	Green-Up	A	2, %, B	W-2		N				1	1		3	+10 %		100		
7	DARWIN (5010)	1,928	0	1,928	0	PER	PER	N	W	Dormant	A	1, 5, B	W-2		N						1		+10 %		100		
8	HUNTER MTN (5013)	55,210	0	55,210	0	PER	PER	I	W, SP	Dormant	A	3, 5, B	W-2		N	3		1	5	6		8	+20 %		100		
9	LACY-CACTUC-McCLOUD (6012)	36,560	382,000	418,560	0	PER	PER	I	W, SP	Dormant	A	3, 5, B	W-2		N	3	1	2	18	6		10	+ 7 %		15	25	60
10	OLANCHA COMMON (6011)	14,540	0	14,540	0	PER	PER	N	SP	Green-Up	A	1, 5, B	W-2		N											100	
11	TUNAWEE COMMON (5009)	30,016	12,864	42,880	0	PER	PER	M	SP	Green-Up	A	2, 5, AB	W-2	H-1,3	N	1	1		2	3	3		5 %		35	35	30
12	ANTELOPE VALLEY (5004)	6,500	0	6,500	0	PER	EPH	N	SP	200 lbs	B	4, 5, A	W-1	H-1	N								N/A		N/A		
13	BISSEL (5001)	4,002	0	4,002	0	EPH	EPH	N	SP	200 lbs	B	4, 5, A	W-1	H-1,	N								N/A		N/A		
14	CANTIL COMMON (5005)	364,800	43,000	407,800	0	EPH	EPH	M	SP	200 lbs	B, C	3, 5, A	W-1	H-2,3	N		5								75	10	15
15	MONOLITH CANTIL (5007)	23,043	26,883	49,926	0	EPH	EPH	M	SP	200 lbs	B	3, 5, A	W-1	H-2,3	N											100	
16	OAK CREEK (5015)	160	0	160	0	EPH/PER	EPH/PER	N	SP	200 lbs	A	5	W-2		N								N/A		N/A		
17	RUDNICK COMMON (5008)	163,973	39,000	202,973	0	EPH/PER	EPH/PER	R	Y	200 lbs	A, B	3, 5, AB	W-2	H-3	Y	8	2	2	4	7		30	+10 %		98		2
18	WARREN (5002)	584	0	584	0	EPH/PER	EPH/PER	N	SP	200 lbs	B	5	W-2		N								N/A		N/A		
19	WALKER PASS (0077)	75,000	0	75,000	0	EPH/PER	EPH/PER	I	W, SP, SM	200 lbs	A, B	2, 4, 5, B	W-2		Y		1		1	3		5	+10 %		100		
20	PAHRUMP VALLEY (5000)	12,286	0	12,286	0	EPH/PER	EPH/PER	N	SP, SM	200 lbs	A, B	1, 5, B	W-2		N									2	98		
21	HANSON (5006)	32,000	32,000	64,000	0	EPH/PER	EPH/PER	M	SP, SM, F	200 lbs	A, B	1, 4, 5, AB	W-2	H-1	N								+ 5 %		100		
22	BORON SHEEP (7114)	4,714	2,768	7,482	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1	N								N/A			100	
23	BUCKHORN CYN (7103)	16,791	4,463	21,254	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1,3	N		1									100	
24	GOLDSTONE (7104)	9,006	0	9,006	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1	N		1									100	
25	GRANITE MTNS (7105)	5,714	0	5,714	0	EPH	EPH	M	Y	200 lbs	B	2, 4, 5, A	W-2		N		1									100	
26	GRAVEL HILLS (7107)	65,598	63,025	128,623	0	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1	H-1,2,3	N		2									100	
27	HARPER LAKE (7119)	12,859	676	13,535	0	EPH/PER	EPH/PER.	M	Y	200 lbs	A, B, C	3, 4, 5, B	W-2		N		2	1		6	4		+ 5 %		25	25	50
28	LAVA MTNS (7108)	16,830	0	16,830	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1,3	N									90	10		
29	PILOT KNOB (7106)	49,150	49,151	98,303	0	EPH	EPH	M	SP, SM, F	200 lbs	A, B	3, 4, 5, A	W-2		N	2	1		1	6					30	20	50
30	SHADOW MTNS (7113)	36,583	5,955	42,538	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1,2	N		1								N/A		
31	SPANGLER HILLS (7112)	66,899	0	66,899	440	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1	H-1,2	N		1								50		50
32	STODDARD MTN (7114)	170,126	99,915	270,041	0	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1	H-1,2	N		1									100	
33	SUPERIOR VALLEY (7116)	167,648	29,584	197,232	0	EPH	EPH	N	SP	200 lbs	B, C	3, 4, 5, A	W-1	H-1,2,3	N		1									100	
34	VALLEY WELL (7117)	640	0	640	0	EPH/PER	EPHP/PER	N	Y	200 lbs	A, B	3, 4, 5, B	W-2		N								0 %			100	
35	NEWBERRY/ORD (6218)	24,049	11,317	35,366	0	EPH	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	2	1	2		4	20		+10 %		100		
36	RATTLESNAKE CYN (7111)	20,475	0	20,475	1,960	PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	3	1	1	2	6	3		+ 5 %		100		
37	WHITEWATER CYN (7118)	26,878	15,333	42,211	0	PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	3	2	2	4	6			+ 5 %	20	80		
38	AFTON CYN (7215)	41,825	41,825	83,650	0	EPH	EPH	N	Y	200 lbs	B	2, 4, 5, A	W-2		Y		2	3		2	20				40	60	
39	CLARK MTN (7203)	71,359	4,300	75,659	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B, C	3, 4, 5, AB	W-2		Y	3	3	1	5	12	8		+10 %		100		
40	COLTON HILLS (7202)	143,888	43,800	187,688	53,310	EPHP/ER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y		2	1	13	3	12	24	+10 %	30	40	30	
41	CRESCENT PEAK (7213)	31,201	0	31,201	383	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y	1	2		3	6			+ 5 %	50	50		
42	CRONESE LAKE (7219)	51,000	12,750	63,750	0	EPH	EPH	N	Y	200 lbs	B	2, 4, 5, A	W-2		Y		2	2	7	4	15				100		
43	GRANITE MTN (7211)	276,175	48,686	324,861	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y	2	2		5	3	10		+10 %	55	40	5	
44	GOLD VALLEY (7212)	15,865	1,721	17,586	0	EPH/PER	EPH/PER	R	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	2	2	1	5	4	2		+ 5 %		100		
45	HORSETHIEF SPGS (7207)	108,793	0	108,793	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	3	2		13	7			+ 5 %	30	30	40	
46	KESSLER SPGS (7208)	233,872	19,346	253,218	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y	3	2	1	7	10	5		+ 7 %	20	80		
47	LANFAIR VALLEY (7210)	339,553	127,641	467,194	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y				15	5			+ 5 %	5	80	15	
48	PIUTE VALLEY (7204)	33,468	4,810	38,278	0	EPH	EPH	N	SP, F	200 lbs	A, B, C	1, 4, 5, A	W02		Y					3	2		+ 2 %	10	90		
49	ROUND VALLEY (7216)	670	3,530	4,200	0	EPH/PER	EPH/PER	N	Y	200 lbs	A, B	3, 4, 5, B	W-2		Y							1	0 %	5	95		
50	VALLEY VIEW (7200)	271,506	17,530	289,036	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y	3	2	2	8	5		20	+ 5 %		80	20	
51	VALLEY WELLS (7209)	237,258	5,970	243,228	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B, C	3, 4, 5, AB	W-2		Y	2	1		10	6	20	20	+ 5 %	5	10	85	
52	FORD DRY LAKE (7044)	19,089	0	19,089	0	EPH	EPH	N	SP, W, F	200 lbs	B	3, 4, 5, A	W-1	H-1,3	N		1	1								100	
53	JEAN LAKE (7217)	5,740	0	5,740	0	EPH/PER	EPH/PER	N	Y	200 lbs	A, B, C	1, 4, 5, AB	W-2		Y								0 %		90	10	
54	LAZY DAISY (7220)	451,617	92,181	543,798	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B, C	3, 4, 5, AB	W-2		Y	4	2		15	8	6		+15 %		100		
55	SHEEP DRIVEWAY	23,040	0	23,040	0	EPH	EPH	N	SP'SM	200 lbs	B	.	W-1	H-2,3	N												
	Total	405,178	1,242,024	5,299,172												49	53	23	254	135	129	127					

⑩ Decision Criteria	⑪ Data Sources
A, B, G	B-1, E-2, F
A, B, E, I-2, G	B-1, C-3, E-2, F
A, B, C-2, E, G	B-1, C-3, E-1/2, F
A, B, C-2, E, I-2, G	B-1, C-3, E-1/2, F
A, B, C-2, E, G	B-1, C-3, E-2, F
A, B, E	B-1, C-3, E-2, F
A, B, D, E	A-3, B-1, D-3, E-2, F
A, B, C-2, D, E, G	A-3, B-1, D-1, E-1/2, F
A, B, C-2, D, E, I-1	A-3, B-1/3, D-1, E-1/2, F
A, B, C-2	A-3, B-1, D-2, E-2, F
A, B, C-2, E, I-1	A-3, B-1, D-2, E-1/2, F
A, F, I-3	B-1, C-3, E-2, F
A, C, F, I-3	B-1, E-2, F
A, B, C-1, H, I-3	A-2, B-1, C-2/3, D-1/2, E-1/2, F
A, B, C-1, I-3	A-2, B-1, D-2, E-2, F
A, F, I-3	B-1, E-2, F
A, B, C-3, I-3, G	A-2/4, B-1, C-2, D-2, E-1/2, F
A, F, I-3	B-1, E-2, F
A, B, C-2, I-2	A-2, B-1, C-2, D-2, E-1/2, F
A, B, I-2/3	B-1, E-1/2, F
A, B, C-2/3, I-3, G	A-2, B-1, C-2, E-1/2, F
A, C-1, F, I-3, G	A-2, B-1, C-1, E-2, F
A, C-1, I-3, G	B-1, C-1, E-2, F
A, C-1, F, H, G	B-1, C-1, E-2, F
A, G	B-1, E-2, F
A, C-1, I-3, G	A-2, B-1, C-1, E-1/2, F
A, C-1, H, G	A-2, B-1, C-1/3, E-2, F
A, B, G	A-2, B-1, E-2, F
A, B, C-1, D, H, I-1, G	A-2, B-1, C-1/3, E-2, F
A, C-1, I-3, G	B-1, E-2, F
A, C-1, H	A-2, B-1, E-2, F
A, C-1, H, I-3	B-1, C-1/3, E-1/2, F
A, B, C-1, H, I-3, G	A-2, B-1, C-2, E-1/2, F
A, G	B-1, C-1, E-2, F
A, B, G	A-5, B-1, C-1/3, E-1/2, F
A, B, G	B-1, C-1/3, E-2, F
A, B, C-2, D, H, I-3, G	B-1, C-1/3, E-2, F
A, B, C-2, /3, H, G	B-1, C-3, E-1/2, F
A, B, C-1/2/3, D, E, H	B-1/2, C-1/3, E-2, F
A, B, C-1/2/3, D, E	A-1/6, B-1/2, C-1/3, D-1, E-1/2
A, B, C-1/2/3, I-2	A-1, B-1/2, C-1/3, E-1/2, F
A, B, G	B-1, C-3, E-1/2, F
A, B, C-2/3, D, E, H	A-1/6, B-1/2, C-1, E-1/2, F
A, C-2/3, D, E	A-1/6, B-1/2/4, C-3, E-2, F
A, B, C-2/3, H, G	B-1/2, C-1/3, E-2/4, F
A, B, C-1/2, D, E	A-1/6, B-1/2, C-1/3, E-1/2
A, B, C-1/2/3, D, E, H, I-3	A-1/6, B-1/2, C-1/3, E-1/2
A, B, C-1, D, E, H	A-1, B-1, C-1, E-2, F
A, B	A-1, B-1, C-1/3, E-2, F
A, B, C-1/2/3, D, E, H	A-1/6, B-1/2, C-1/3, D-2, E-1/2
A, B, C-1/2/3, D, E, H, G	B-1/2, C-1/3, E-2, F
A, B, H, G	B-1, E-2, F
A, C-1, I-2, G	B-1, C-1, E-2, F
A, B, C-1/2/3, H	B-1, C-1, E-2%5, F

MANAGEMENT PRACTICES PRESCRIBED

① RANGE TYPE:
PER = Perennial
EPH = Ephemeral

② TYPE AMP (Allotment Management Plan):
I = INTENSIVE:
Strict and detailed schedule of defferred rotational systems
M = MODERATE:
Management system imposed, but does not include strict rotational system
N = NON-INTENSIVE:
No psture restriction other than distribution of livestock according to availability of forage and water
R = INTENSIVE:
Strict and detailed schedule of rest-rotational systems

③ SEASON OF USE:
SP = Spring
SM = Summer
F = Winter
W = Year-round

④ FORAGE READINESS.
This will be judged on the basis of forage plant phenology and will be employed for determining turnout dates and pasture shifts
Green Up = Early flowering of key species
Dormant = Plant growth generally inactive
200 lbs = When 200 lbs of dry weight production of ephemerals is present or reasonably anticipated on selected sites

⑤ MAXIMUM ALLOWABLE UTILIZATION OF KEY SPECIES.
A = 40 - 50% use of new growth of key forage species
B = 50% use of ephemeral production and depletion of supporting soil moisture
C = 25% use of ephemeral production and depletion of soil moisture

⑥ MONITORING AND ADJUSTMENTS:
Monitoring:
1) Transects or utilization plots
2) Transect and utilization plos
3) Transect and utilization plots and exclosures
4) Annual production plots
5) Livestock monitoring or actual use

Adjustments:
A) Stocking rates determined each growing year
B) Every fifth year, permanent plot data for perennial plant cover (transects and exclosures) will be reviewed to determine if adjustments in the yearly stocking rate formuals are needed to achieve desired production on a sustained yield basis
C) Evaluation of all trend and condition plot data after each grazing cycle. Modify grazing program when needed to meet condition, trend, and production objectives

⑦ WATERING AND HANDLING:
Watering:
W1) Non-permanent; designated critical areas to be avoided
W2) Permanent designated areas
Handling:
H1) Open herding
H2) 1 mile buffer - roadways designated annually
H3) Designated areas for loading and unloading

⑧ EAR TAGS.
The use of ear tagging may be needed for some allotments
N) Ear tagging will not occur
Y) Ear tagging will occur

⑨ ESTIMATED PERCENT INCREASE AVAILABLE PERENNIAL FORAGE ALLOCATIONS FOR LIVESTOCK

⑩ DECISION CRITERA:
These are the major factors influencing grazing allotment decisions
A = Forage production surveys
B = Multiple use class designations - primarily Class C
C = Wildlife requirements:
  1) Tortoise
  2) Big game
  3) Listed and Sensitive Species
D = Burro populations (and wild horse)
E = Burro and Wild Horse Management prescriptions
F = Land Tenure Adjustments
G = Future economic projection
H = Areas of Critical Environmental Concern (ACEC)
I = Boundary considerations:
  1) Other agencies (NPS, FS, DOD)
  2) CDCA boundaries (allotment extends outside the CDCA)
  3) Extensive private land adjacent to public lands

⑪ DATA SOURCES USED TO PRODUCE THE RANGE ELEMENT CHARTS:
A = Vegetation and Range Surveys:
  1) URA-MFP East Mojave 1976
  2) URA-MFP El Paso/Red Mtn 1975
  3) Adjudication COSD 1966
  4) Rudnick Survey 1970
  5) Ord Mtn Survey 1977
  6) East Mojave Range Survey 1969
B = Allotment files:
  1) Actusl use records
  2) Trend plots for East Mojave
  3) Trend plots for Naval Weapons Center
  4) AMP Southcott
C = Special reports and interviews:
  1) Allotment review - Riverside District 1979
  2) Allotment review - Bakersfield District 1979
  3) UC Extension Service questionnaire 1979
D = Comparison areas.
  1) Exclosure
  2) Highway right-of-way
  3) Relic areas (little grazed)
E = CDCA Inventory:
  1) Large scale aerial transects
  2) Satellite spectral class designations
  3) Lucerne Valley vegetative survey 1978
  4) Kingston Mtns vegetative survey 1978
  5) Turtle Mtns vegetative survey 1978
F = Professional observations and evaluations

MANAGEMENT PRACTICES PRESCRIBED

● USE ALTERNATIVE ●

Allotments		Acres				❶ Range Type Classified		Prescribed Management Practices								Prescribed New Range Improvements							❾ Future Expectations	Multiple Use Class Distribution			
								❷	❸	❹	❺	❻	❼ REGULATIONS FOR . CONCENTRATION AREAS		❽	WATER SOURCE DEVELOPMENT			WATER DISTRIBUTION		FENCING			(% OF ALLOTMENT)			
MAP NUMBER	NAME (BLM NUMBER)	PUBLIC	PRIVATE and MILITARY EXCHANGE OF USE	TOTAL	OTHER	Existing	Proposed	Type of AMP	Season of Use	Forage Readiness	Maximum Allowable Utilization	Monitoring and Adjustment	Watering	Handling	Ear Tags	Springs	Wells	Catch-ments	Pipeline (miles)	Troughs	Boundary (miles)	Pasture (miles)		C	L	M	I
1	FISHLAKE VALLEY (6003)	1,482	0	1,482	0	PER	PER	N	SP, SM	Green-Up	A	1	W-2		N								0 %			100	
2	BAR 99 (6001)	13,671	0	13,671	0	PER	PER	M	SP, F	Green-Up	A	2, 5, B	W-2		N		1		1	2			+ 5 %			100	
3	DEEP SPRINGS (6005)	43,028	0	43,028	0	PER	PER	I	W, SP	Dormant	A	3, 5, B	W-2		N	1	1		6	4		6	+10 %			100	
4	LAST CHANCE (6004)	94,711	0	94,711	0	PER	EPH/PER	N	Y	200 lbs	A, B	3, 5, B	W-2		Y								+20 %		50	50	
5	OASIS RANCH (6000)	22,894	0	22,894	0	PER	PER	N	F, W, SP	Dormant	A	2, 5, B	W-2		N								+10 %			100	
6	SOUTH OASIS (6006)	10,884	0	10,884	0	PER	PER	N	SP, F	Green-Up	A	2, 5, B	W-2		N				1	1		3	+10 %		100		
7	DARWIN (5010)	1,928	0	1,928	0	PER	PER	N	W	Dormant	A	1, 5, B	W-2		N						1		+10 %			100	
8	HUNTER MTN (5013)	55,210	0	55,210	0	PER	PER	I	W, SP	Dormant	A	3, 5, B	W-2		N	3		1	5	6		8	+30 %		100		
9	LACY-CACTUC-McCLOUD (6012)	36,560	382,000	418,560	0	PER	PER	I	W, SP	Dormant	A	3, 5, B	W-2		N	3	1	2	18	6		10	+ 7 %			40	60
10	OLANCHA COMMON (6011)	14,540	0	14,540	0	PER	PER	N	SP	Green-Up	A	1, 5, B	W-2		N								0 %			100	
11	TUNAWEE COMMON (5009)	30,016	12,864	42,880	0	PER	PER	M	SP	Green-Up	A	2, 5, AB	W-2	H-1,3	N	1	1		2	3	3		5 %		20	15	65
12	ANTELOPE VALLEY (5004)	6,500	0	6,500	0	PER	EPH	N	SP	200 lbs	B	4, 5, A	W-1	H-1	N										N/A		
13	BISSEL (5001)	4,002	0	4,002	0	EPH	EPH	N	SP	200 lbs	B	4, 5, A	W-1	H-1,	N										N/A		
14	CANTIL COMMON (5005)	364,800	43,000	407,800	0	EPH	EPH	M	SP	200 lbs	B	3, 5, A	W-1	H-2,3	N		5									100	
15	MONOLITH CANTIL (5007)	23,043	26,883	49,926	0	EPH	EPH	M	SP	200 lbs	B	3, 5, A	W-1	H-2,3	N											100	
16	OAK CREEK (5015)	160	0	160	0	PER	EPH/PER	N	SP	200 lbs	A	5	W-2		N										N/A		
17	RUDNICK COMMON (5008)	163,973	39,000	202,973	0	PER	EPH/PER	R	Y	200 lbs	A, B	3, 5, AB	W-2	H-3	Y	8	2	2	4	7		30	+10 %			100	
18	WARREN (5002)	584	0	584	0	PER	EPH/PER	N	SP	200 lbs	B	5	W-2		N										N/A		
19	WALKER PASS (0077)	75,000	0	75,000	0	PER	EPH/PER	I	W, SP, SM	200 lbs	A, B	2, 4, 5, B	W-2		Y				1	3		5	+10 %		95	5	
20	PAHRUMP VALLEY (5000)	12,286	0	12,286	0	PER	EPH/PER	N	SP, SM	200 lbs	A, B	1, 5, B	W-2		N											100	
21	HANSON (5006)	32,000	32,000	64,000	0	PER	EPH/PER	M	SP, SM, F	200 lbs	A, B	1, 4, 5, AB	W-2	H-1	N								+ 5 %	2		98	
22	BORON SHEEP (7114)	4,714	2,768	7,482	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1	N		1									100	
23	BUCKHORN CYN (7103)	16,791	4,463	21,254	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1	N		1									100	
24	GOLDSTONE (7104)	9,006	0	9,006	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1	H-1,3	N		1									100	
25	GRANITE MTNS (7105)	5,714	0	5,714	0	EPH	EPH	M	Y	200 lbs	B	2, 4, 5, A	W-2	H-1	N		1								N/A		
26	GRAVEL HILLS (7107)	65,598	63,025	128,623	0	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1		N		2									100	
27	HARPER LAKE (7119)	12,859	676	13,535	0	EPH	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, B	W-2	H-1,2,3	N		2	1		6	4		+ 5 %		N/A		
28	LAVA MTNS (7108)	16,830	0	16,830	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1		N										100		
29	PILOT KNOB (7106)	49,150	49,151	98,303	0	EPH	EPH	M	SP, SM, F	200 lbs	A, B	3, 4, 5, A	W-2	H-1,3	N	2	1		1	6						50	50
30	SHADOW MTNS (7113)	36,583	5,955	42,538	0	EPH	EPH	N	SP	200 lbs	B	2, 4, 5, A	W-1		N		1									100	
31	SPANGLER HILLS (7112)	66,899	0	66,899	440	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1	H-1,2	N		1								50	50	
32	STODDARD MTN (7114)	170,126	99,915	270,041	0	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1	H-1,2	N		1									10	90
33	SUPERIOR VALLEY (7116)	167,648	29,584	197,232	0	EPH	EPH	N	SP	200 lbs	B	3, 4, 5, A	W-1	H-1,2,3	N		1									100	
34	VALLEY WELL (7117)	640	0	640	0	PER	EPHP/PER	N	Y	200 lbs	A, B	3, 4, 5, B	W-2	H-1,2	N								0 %				100
35	NEWBERRY/ORD (6218)	24,049	11,317	35,366	0	EPH	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	4	2	2		4	20		+10 %		15	35	50
36	RATTLESNAKE CYN (7111)	20,475	0	20,475	1,960	PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	3	1	1	2	6	3		+ 5 %		100		
37	WHITEWATER CYN (7118)	26,878	15,333	42,211	0	PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		N	3	2	2	4	6			+ 5 %		100		
38	AFTON CYN (7215)	41,825	41,825	83,650	0	EPH	EPH	N	Y	200 lbs	A, B	2, 4, 5, A	W-2		Y		2	3		2	20					60	40
39	CLARK MTN (7203)	71,359	4,300	75,659	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		Y	3	3	1	5	12	8		+15 %		10	90	
40	COLTON HILLS (7202)	143,888	43,800	187,688	53,310	EPHP/ER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y		2	1	15	3	12	25	+15 %		10	90	
41	CRESCENT PEAK (7213)	31,201	0	31,201	383	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	1	2		3	6			+ 5 %			100	
42	CRONESE LAKE (7219)	51,000	12,750	63,750	0	EPH	EPH	N	Y	200 lbs	A, B	3, 4, 5, A	W-2		Y		2	2	7	4	15					100	
43	GRANITE MTN (7211)	276,175	48,686	324,861	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	3	3	3	12	4	15		+15 %	15	20	30	35
44	GOLD VALLEY (7212)	15,865	1,721	17,586	0	EPH/PER	EPH/PER	R	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	2	2	1	5	4	2		+ 5 %			100	
45	HORSETHIEF SPGS (7207)	108,793	0	108,793	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	3	3		18	7			+ 5 %	10		50	40
46	KESSLER SPGS (7208)	233,872	19,346	253,218	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B, C	3, 4, 5, AC	W-2		Y				15	5			+ 5 %		10	90	
47	LANFAIR VALLEY (7210)	339,553	127,641	467,194	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	1			3	2			+ 2 %		10	85	5
48	PIUTE VALLEY (7204)	33,468	4,810	38,278	0	EPH	EPH	N	SP, F	200 lbs	A, B	1, 4, 5, A	W-2		Y							1	9 %			100	
49	ROUND VALLEY (7216)	670	3,530	4,200	0	EPH/PER	EPH/PER	N	Y	200 lbs	A, B	3, 4, 5, B	W-2		Y	3	2	3	19	6		25	+ 5 %			100	
50	VALLEY VIEW (7200)	271,506	17,530	289,036	0	EPH/PER	EPH/PER	I	Y	200 lbs	A, B	3, 4, 5, AC	W-2		Y	2	1		15	6	25	20	+ 5 %			100	
51	VALLEY WELLS (7209)	237,258	5,970	243,228	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B	3, 4, 5, AB	W-2		Y		1	1		2						100	
52	FORD DRY LAKE (7044)	19,089	0	19,089	0	EPH	EPH	N	SP, W, F	200 lbs	B	3, 4, 5, A	W-1	H-1,3	N								9 %				100
53	JEAN LAKE (7217)	5,740	0	5,740	0	EPH/PER	EPH/PER	N	Y	200 lbs	A, B	1, 4, 5, AB	W-2		Y	5	3		18	10	6		+15 %			100	
54	LAZY DAISY (7220)	451,617	92,181	543,798	0	EPH/PER	EPH/PER	M	Y	200 lbs	A, B, C ·	3, 4, 5, AB	W-2		Y											100	
55	SHEEP DRIVEWAY	23,040	0	23,040	0	EPH	EPH	N	SP' SM	200 lbs	B		W-1	H-2,3	N												
	Total	405,178	1,242,024	5,299,172												54	57	27	181	145	139	133					

⑩ Decision Criteria	⑪ Data Sources
A,B,G	B-1, E-2, F
A,B,E,I-2, G	B-1, C-3, E-2, F
A,B, C-2, E,G	B-1, C-3, E-1/2, F
A,B,C-2,E,I-2,G	B-1, C-3, E-1/2, F
A,B, C-2, E,G	B-1, C-3, E-2, F
A,B,E	B-1, C-3, E-2, F
A,B,D,E	A-3, B-1, D-23, E-2, F
A,B, C-2, D,E,G	A-3, B-1/3, D-1, E-1/2, F
A,B, C-2, D,E, I-1	A-1/3,B-1/3,D-1,E-1/2,F
A,B, C-2	A-3, B-1, D-2, E-2, F
A,B, C-2, E, I-1	A-1/3,B-1,D-2,E-1/2, F
A,F, I-3	B-1, C-3, E-2, F
A,C,F, I-3	B-1, E-2, F
A,B, C-1,H,I-3	A-2,B-1,C-2/3,D-1,E-1/2,F
A,B, C-1, I-3	A-2, B-1, D-2, E-2, F
A,F, I-3	B-1, E-2, F
A,B,C-3,I-3,G	A-2/4,B-1,C-2,D-2,E-1/2, F
A,F, I-3	B-1, E-2, F
A,B, C-2, I-2	A-2, B-1, C-2, D-2, E-1/2, F
A,B, I-2/3	B-1, E-1/2, F
A,B,C-1%3,I-3,G	A-2, B-1, C-2, E-1/2, F
A, C-1,F,I-3,G	A-2, B-1, C-1/3, E-2, F
A, C-1, I-3, G	B-1, C-1, E-2, F
A, C-1, F,H,G	B-1, C-1, E-2, F
A,G	
A, C-1, I-3,G	A-2, B-1, C-1, E-1/2, F
A, C-1, H,G	A-2, B-1, C-1, E-1/2, F
A,B,G	A-2, B-1, E-2, F
A, C-1, D,H,I-1,G	A-2, B-1, C-1/3, E-2, F
A, C-1, I-3, G	B-1, E-2, F
A, C-1, H	A-2, B-1, E-2, F
A, C-1, H, I-3	B-1, C-1/3, E-1/2, F
A, C-1,H, I-3,G	A-2, B-1, C-2, E-1/2, F
A,G	B-1, C-1, E-2, F
A,B,G	A-5,B-1,C-1/3,E-1/2, F
A,B,G	B-1, C-1/3, E-2, F
A, C-2,D,H,I-3,G	B-1, C-1/3, E-2, F
A, C-2/3, H,G	B-1, C-3, E-1/2, F
A,C-1/2/3,D,E,G,H	B-1/2, C-1/3, E-2, F
A, C-1/2/3, D,E	A-1/6,B-1/2,C-1/3,D-2,E-1/2,F
A,C-1/2/3,I-2	A-1,B-1/2,C-1/3,E-1/2,F
A,G	A-1, B-1, C-3, E-1/2, F
A,B,C-2/3,D,E,H	A-1/6,B-1/2,C-1,E-1/2, F
A, C-2/3, D,E	A-1/6,B-1/2/4,C-3,E-2,F
A,B,C-2/3,G,H	B-1/2, C-1/3, E-2/4, F
A, C-1/2, D,E	A-1/6,B-1/2,C-1/3,E-1/2, F
A,C-1/2/3,D,E,H,I-3	A-1/6,B-1/2,C-1/3,E-1/2, F
A, C-1, D,E,H	A-1, B-1, C-2, F
A	A-1, B-1, C-1/3, E-2, F
A, C-1/2/3, D,E,H	A-1/6,B-1/2,C-1/3,D-2,E-1/2,F
A, C-1/2/3, D,E,G,H	B-1/2, C-1/3, E-2, F
A,G,H	B-1, E-2, F
A, C-1, I-2, G	B-1, C-1, E-2, F
A,B, C-1/2/3, H	B-1, C-1, E-2/5, F

MANAGEMENT PRACTICES PRESCRIBED

① RANGE TYPE:
PER = Perennial
EPH = Ephemeral

② TYPE AMP (Allotment Management Plan):
I = INTENSIVE:
Strict and detailed schedule of defferred rotational systems
M = MODERATE:
Management system imposed, but does not include strict rotational system
N = NON-INTENSIVE:
No psture restriction other than distribution of livestock according to availability of forage and water
R = INTENSIVE:
Strict and detailed schedule of rest-rotational systems

③ SEASON OF USE:
SP = Spring
SM = Summer
F = Winter
W = Year-round

④ FORAGE READINESS:
This will be judged on the basis of forage plant phenology and will be employed for determining turnout dates and pasture shifts
Green Up = Early flowering of key species
Dormant = Plant growth generally inactive
200 lbs = When 200 lbs of dry weight production of ephemerals is present or reasonably anticipated on selected sites

⑤ MAXIMUM ALLOWABLE UTILIZATION OF KEY SPECIES:
A = 40 - 50% use of new growth of key forage species
B = 50% use of ephemeral production and depletion of supporting soil moisture
C = 25% use of ephemeral production and depletion of soil moisture

⑥ MONITORING AND ADJUSTMENTS:
Monitoring:
1) Transects or utilization plots
2) Transect and utilization plos
3) Transect and utilization plots and exclosures
4) Annual production plots
5) Livestock monitoring or actual use

Adjustments:
A) Stocking rates determined each growing year
B) Every fifth year, permanent plot data for perennial plant cover (transects and exclosures) will be reviewed to determine if adjustments in the yearly stocking rate formuals are needed to achieve desired production on a sustained yield basis
C) Evaluation of all trend and condition plot data after each grazing cycle. Modify grazing program when needed to meet condition, trend, and production objectives

⑦ WATERING AND HANDLING:
Watering:
W1) Non-permanent; designated critical areas to be avoided
W2) Permanent designated areas
Handling:
H1) Open herding
H2) 1 mile buffer - roadways designated annually
H3) Designated areas for loading and unloading

⑧ EAR TAGS:
The use of ear tagging may be needed for some allotments
N) Ear tagging will not occur
Y) Ear tagging will occur

⑨ ESTIMATED PERCENT INCREASE AVAILABLE PERENNIAL FORAGE ALLOCATIONS FOR LIVESTOCK

⑩ DECISION CRITERA:
These are the major factors influencing grazing allotment decisions
A = Forage production surveys
B = Multiple use class designations - primarily Class C
C = Wildlife requirements:
1) Tortoise
2) Big game
3) Listed and Sensitive Species
D = Burro populations (and wild horse)
E = Burro and Wild Horse Management prescriptions
F = Land Tenure Adjustments
G = Future economic projection
H = Areas of Critical Environmental Concern (ACEC)
I = Boundary considerations.
1) Other agencies (NPS, FS, DOD)
2) CDCA boundaries (allotment extends outside the CDCA)
3) Extensive private land adjacent to public lands

⑪ DATA SOURCES USED TO PRODUCE THE RANGE ELEMENT CHARTS:
A = Vegetation and Range Surveys:
1) URA-MFP East Mojave 1976
2) URA-MFP El Paso/Red Mtn 1975
3) Adjudication COSO 1966
4) Rudnick Survey 1970
5) Ord Mtn Survey 1977
6) East Mojave Range Survey 1969
B = Allotment files.
1) Actusl use records
2) Trend plots for East Mojave
3) Trend plots for Naval Weapons Center
4) AMP Southcott
C = Special reports and interviews.
1) Allotment review - Riverside District 1979
2) Allotment review - Bakersfield District 1979
3) UC Extension Service questionnaire 1979
D = Comparison areas
1) Exclosure
2) Highway right-of-way
3) Relic areas (little grazed)
E = CDCA Inventory.
1) Large scale aerial transects
2) Satellite spectral class designations
3) Lucerne Valley vegetative survey 1978
4) Kingston Mtns vegetative survey 1978
5) Turtle Mtns vegetative survey 1978
F = Professional observations and evaluations

VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

● PROTECTION ALTERNATIVE ●

Allotments		Acres				① Range Type	Livestock Forage Allocation AUM's						Multiple Use Class Distribution (% OF ALLOTMENT)				⑩ Decision Criteria	⑪ Data Sources
							Cattle			Sheep								
MAP NUMBER	NAME (BLM NUMBER)	PUBLIC	PRIVATE and MILITARY EXCHANGE OF USE	TOTAL	OTHER		PUBLIC	EXCHANGE OF USE	TOTAL	PUBLIC	EXCHANGE OF USE	TOTAL	C	L	M	I		
1	FISHLAKE VALLEY (6003)	1,482	0	1,482	0	PER	52	0	52					100			A, B	B-1, E 2, F
2	BAR 99 (6001)	13,671	0	13,671	0	PER	307	0	307					100			A,B,E, I-2	B-1, C-3, E-2, F
3	DEEP SPRINGS (6005)	43,028	0	43,028	0	EPH/PER	1,050	0	1,050				30	70			A,B,C-2/3, E	B-1, C-3, E-2, F
4	LAST CHANCE (6004)	94,711	0	94,711	0	EPH/PER	2,000	0	2,000				70	30			A,B,C-2, E,G,I	B-2, C-3, E-1/2, F
5	OASIS RANCH (6000)	22,894	0	22,894	0	PER	656	0	656				100				B,G	F
6	SOUTH OASIS (6006)	10,884	0	10,884	0	PER	300	0	300				55	45			B,G	F
7	DARWIN (5010)	1,928	0	1,928	0	PER	43	0	43					100			A,B,D,E	A-3, B-1, D-3, E-2, F
8	HUNTER MTN (5013)	55,210	0	55,210	0	PER	1,105	0	1,105				50	50			B, C-2, G	F
9	LACY-CACTUS-McCLOUD (6012)	36,560	382,000	418,560	0	PER	455	4,094	4,549					40		navy 60	A,B,C-2, D,E,I	A-3, B-1/3, D-1, E-1/2, F
10	OLANCHA COMMON (6011)	14,540	0	14,540	0	PER	702	0	702					100			A,B,C-2	A-3, B-1, D-2, E-2, F
11	TUNAWEE COMMON (5009)	30,016	12,864	42,880	0	PER	1,314	563	1,877	54	23	77	35	35		navy 30	A,B,C-2, E,I	A-1/3, B-1, D-2, E 1/2, F
12	ANTELOPE VALLEY (5004)	6,500	0	6,500	0	EPH/PER				325	0	325		N/A			A,F,I-3	B-1, C-3, E-2, F
13	BISSEL (5001)	4,002	0	4,002	0	EPH				200	0	200		N/A			A,C,F,I-3	B-1, E-2, F
14	CANTIL COMMON (5005)	364,800	43,000	407,800	0	EPH				0–19,000	0–2,090	0–21,090	10	80	10		A,B,C 1, H,I-3	A-2, B 1, C-2/3, D-1/2, E-1/2
15	MONOLITH CANTIL (5007)	23,043	26,883	49, 926	0	EPH				0–1,500	0–1,500	0–3,000		100			A,B,C-1, I-3	A-2, B-1, D-2, E-2, F
16	OAK CREEK (5015)	160	0	160	0	EPH/PER	16	0	16					N/A			A,F,I-3	B-1, E-2, F
17	RUDNICK COMMON (5008)	163,973	39,000	202,973	0	EPH/PER	10,000–24,000	2,400–5,760	10,000–29,760				18	82			A,B,C-3, G,I	A-2/4, B-1, C-2, D-2, E-1/2
18	WARREN (5002)	584	0	584	0	EPH/PER				55	0	55		N/A			A,F, I 3	B-1, E-2, F
19	WALKER PASS (0077)	75,000	0	75,000	0	EPH/PER	3,500	0	3,500				85	15			A,B,C-2, G,I-2	A-2, B-1, C 2, D-2, E 1/2, F
20	PAHRUMP VALLEY (5000)	12,286	0	12,286	0	EPH/PER	550	0	550				100				B,G	F
21	HANSON (5006)	32,000	32,000	64,000	0	EPH/PER	194	194	388	1,041	1,041	2,082	50	50			A,B,C-2/3, G,I-3	A 2, B-1, C-2, E-1/2, F
22	BORON SHEEP (7114)	4,714	2,768	7,482	0	EPH				0–200	0–74	0–274		N/A			A,C-1, F,I-3	A 2, B-1, C-1/3, E-2, F
23	BUCKHORN CYN (7103)	16,791	4,463	21,254	0	EPH				0–800	0–168	0–968		100			A,C-1, I-3	B-1, C 1, E-2, F
24	GOLDSTONE (7104)	9,006	0	9,006	0	EPH				0–200	0	0–200			100		A,C-1, F,H	B-1, C-1, E-2, F
25	GRANITE MTNS (7105)	5,714	0	5,714	0	EPH					N/A			100			A	B-1, E-2, F
26	GRAVEL HILLS (7107)	65,598	63,025	128,623	0	EPH				0–1,500	0–735	0–2,235		100			A,C-1, I-3	A-2, B-1, C-1, E 1/2, F
27	HARPER LAKE (7119)	12,859	676	13,535	0	EPH/PER	1,000–3,000	50–150	1,050–3,150					100			A,C-1, H	A-2, B 1, C 1/3, E-2, F
28	LAVA MTNS (7108)	16,830	0	16,830	0	EPH				0	0	0	100				A,B	A-2, B-1, E-2, F
29	PILOT KNOB (7106)	49,150	49,151	98,301	0	EPH	0–1,800	0–1,800	0–3,600				15	15	20	navy 50	A,B,C-1, D,H,I-3	A-2, B-1, C-1/3, E 2, F
30	SHADOW MTNS (7113)	36,583	5,955	42,538	0	EPH				0–1,500	0–210	0–1,710		100			A,C-1, I 3	B-1, E-2, F
31	SPANGLER HILLS (7112)	66,899	0	66,899	440	EPH				0–1,000	0	0–1,000		100			A,C-1, H	A-2, B 1, E-2, F
32	STODDARD MTN (7114)	170,126	99,915	270,041	0	EPH				0–6,000	0–2,220	0–8,220		100			A,C-1, H,I-3	B 1, C-1/3, E 1/2, F
33	SUPERIOR VALLEY (7116)	167,648	29,584	197,232	0	EPH				0–3,000	0–450	0–3,450		50	50		A,B,C-1, H,I 3	A-2, B-1, C-2, E 1/2, F
34	VALLEY WELL (7117)	640	0	640	0	EPH/PER	24	0	24					100			A	B-1, C-1, E 2, F
35	NEWBERRY / ORO (6218)	24,049	11,317	35,366	0	EPH	1,200–2,400	334–768	1,584–3,168				10	90			A,B	A-5, B 1, C-1/3, E-1/2, F
36	RATTLESNAKE CYN (7111)	20,475	0	20,475	1,960	EPH/PER	1,200–2,000	0	1,200–2,000				90	10			A,B	B-1, C-1/3, E-2, F
37	WHITEWATER CYN (7118)	36,878	15,333	42,211	0	EPH/PER	768	276	1,043				20	80			A,B,C-2, D,H,I-3	B-1, C-1/3, E-2, F
38	AFTON CYN (7215)	41,825	41,825	83,650	0	EPH	0–1,000	0–1,000	0–2,000				25	75			A,B,C 2/3, H	B-1, C-3, E-1/2, F
39	CLARK MTN (7203)	71,359	4,300	75,659	0	EPH/PER	1,900–2,000	114–200	2,014–2,200				5	95			A,B,C-1/2/3, D,E,H	B 1/2, C-1/3, E-2, F
40	COLTON HILLS (7202)	143,888	43,800	187,688	53,310	EPH/PER	2,877–3,200	662–736	3,539–3,936				25	75			A,B,C-1/2/3, D,E,G	A-1/6, B-1/2, C-1/3, D-1, E-1/2, F
41	CRESCENT PEAK (7213)	31,201	0	31,201	383	EPH/PER	1,560–1,900	0	1,560–1,900				100				A,B,C-1/2/3, G,I-2	A-1, B-1/2, C-1/3, E-1/2, F
42	CRONESE LAKE (7219)	51,000	12,750	63,750	0	EPH	0–509	0–102	0–611				95	5			A,B,G	B-1, C-3, E-1/2, F
43	GRANITE MTN (7211)	276,175	48,686	324,861	0	EPH/PER	3,844	577	4,421				85	15			A,B,C-2/3, D,E,G,H	A-1/6, B-1/2, C-1, E-1/2, F
44	GOLD VALLEY (7212)	15,865	1,721	17,586	0	EPH/PER	1,200–1,380	12–14	1,212–1,394					100			A,C-2/3, D,E	A-1/6, B-1/2/4, C-3, E-2, F
45	HORSETHIEF SPRINGS (7207)	108,793	0	108,793	0	EPH/PER	2,418–2,800	0	2,418–2,800				50	40	10		A,B,C-2/3, H	B-1/2, C-1/3, E-2/4, F
46	KESSLER SPRINGS (7208)	233,872	19,346	253,218	0	EPH/PER	8,016–9,000	641–728	8,657–9,728								A,B,C-1/2, D,E	A-1/6, B-1/2, C-1/3, E-1/2, F
47	LANFAIR VALLEY (7210)	339,553	127,641	467,194	0	EPH/PER	12,165–140,000	3,285–37,800	15,450–177,800				50	50			A,B,C-1/2/3, D,E,G,H,I	A-1/6, B 1/2, C-1/3, E-1/2, F
48	PIUTE VALLEY (7204)	33,468	4,810	38,278	0	EPH	0–180	0–23	0–203				40	60			A,B,C-1, D,E,G,H	A-1, B-1, C-1, E-2, F
49	ROUND VALLEY (7216)	670	3,530	4,200	0	EPH/PER	27	23	50				25	25		50	A,B	A-1, B-1, C-1/3, E-2, F
50	VALLEY VIEW (7200)	271,506	17,530	289,036	0	EPH/PER	8,485–10,000	509–600	8,994–10,600				35	65			A,B,C-1/2/3, D,E,H	A-1/6, B 1/2, C-1/3, D-2, E-1/2
51	VALLEY WELLS (7209)	237,258	5,970	243,228	0	EPH/PER	4,848–5,200	97–104	4,945–5,304				50	50			A,B,C-1/2/3, D,E,H	B-1/2, C-1/3, E-2, F
52	FORD DRY LAKE (7044)	19,089	0	19,089	0	EPH	0–1,500	0	0–1,500				50	50			A,B,H	B-1, E-2, F
53	JEAN LAKE (7217)	5,740	0	5,740	0	EPH/PER	312	0	312					100			A,C-1, I-2	B-1, C-1, E-2, F
54	LAZY DAISY (7220)	451,617	92,181	543,798	0	EPH/PER	2,400–3,000	408–510	2,808–3,510				70	30			A,B,C-1/2/3, H	B-1, C-1, E-2/5, F
55	SHEEP DRIVEWAY (5098)	23,040	0	23,040	0	EPH				0–1,000	0	0–1,000					N/A	N/A

VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

① RANGE TYPE
PER = Perennial
EPH = Ephemeral

⑩ DECISION CRITERIA
These are the major factors influencing grazing allotment decisions
A = Forage production surveys
B = Multiple use class designations - primarily Class C
C = Wildlife requirements:
1) Tortoise
2) Big Game
3) Listed and Sensitive Species
D = Burro populations (and wild horse)
E = Burro and Wild Horse management prescriptions
F = Land Tenure Adjustments
G = Future economic projection
H = Areas of Critical Environmental Concern (ACEC)
I = Boundary considerations.
1) Other agencies (NPS, FS, DOD)
2) CDCA boundaries (allotment extends outside the CDCA)

⑪ DATA SOURCES USED TO PRODUCE THE RANGE ELEMENT CHARTS

A = Vegetation and Range Surveys:
1) URA-MFP East Mojave 1976
2) URA-MFP El Paso/Red Mtn 1975
3) Adjudication CDSO 1966
4) Rudnick Survey 1970
5) Ord Mtn Survey 1977
6) East Mojave Range Survey 1969

B = Allotment Files
1) Actual use records
2) Trend plots for East Mojave
3) Trend plots for Naval Weapons Center
4) AMP Southcott

C = Special Reports and Interviews.
1) Allotment reveiw - Riverside District 1979
2) Allotment review - Bakersfield District 1979
3) UC Extension Service quetionnaire 1979

D = Comparison Areas
1) Exclosure
2) Highway Right-of-Way
3) Relic Areas (little grazed)

E = CDCA Inventory:
1) Large scale aerial transects
2) Satellite spectral class designations
3) Lucerne Valley vegetative survey 1978
4) Kingston Mtns vegetative survey 1978
5) Turtle Mtns vegetative survey 1978

F = Professional observations and evaluations

VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

● BALANCED ALTERNATIVE ●

Allotments		Acres				① Range Type	Livestock Forage Allocation AUM's						Multiple Use Class Distribution (% OF ALLOTMENT)				⑩ Decision Criteria	⑪ Data Sources
							Cattle			Sheep								
MAP NUMBER	NAME (BLM NUMBER)	PUBLIC	PRIVATE and MILITARY EXCHANGE OF USE	TOTAL	OTHER		PUBLIC	EXCHANGE OF USE	TOTAL	PUBLIC	EXCHANGE OF USE	TOTAL	C	L	M	I		
1	FISHLAKE VALLEY (6003)	1,482	0	1,482	0	PER	52	0	52					100			A,B	B-1, E-2, F
2	BAR 99 (6001)	13,671	0	13,671	0	PER	307	0	307					100			A,B,E,I-2	B-1, C-3, E-2, F
3	DEEP SPRINGS (6005)	43,028	0	43,028	0	EPH/PER	1,250	0	1,250					100			A,B,C-2, E	B-1, C-3, E-1/2, F
4	LAST CHANCE (6004)	94,711	0	94,711	0	EPH/PER	3,235	0	3,325					100			A,B,C-1, E,I-2	B-1, C-3, E-1/2, F
5	OASIS RANCH (6000)	22,894	0	22,894	0	PER	656	0	656					100			A,B,C-2, E	B-1, C-3, E-2, F
6	SOUTH OASIS (6006)	10,884	0	10,884	0	PER	429	0	429					100			A,B,E	B-1, C-3, E-2, F
7	DARWIN (5010)	1,928	0	1,928	0	PER	43	0	43					100			A,B,D,E	A-3, B-1, D-3, E-2, F
8	HUNTER MTN (5013)	55,210	0	55,210	0	PER	1,105	0	1,105					100			A,B,C-2, D,E	A-3, B-1, D-1, E-1/2, F
9	LACY-CACTUS-McCLOUD (6012)	36,560	382,000	418,560	0	PER	455	4,094	4,549					15	25	navy 60	A,B,C-2, D,E,I-1	A-3, B-1/3, D-1, E-1/2, F
10	OLANCHA COMMON (6011)	14,540	0	14,540	0	PER	702	0	702						100		A,B,C-2	A-3, B-1, D-2, E-2, F
11	TUNAWEE COMMON (5009)	30,016	12,864	42,880	0	PER	1,314	563	1,877	54	23	77		35	35	navy 30	A,B,C-2, E,H,I-1	A-3, B-1, D-2, E-1/2, F
12	ANTELOPE VALLEY (5004)	6,500	0	6,500	0	EPH/PER				325	0	325		N/A			A,F,I-3	B-1, C-3, E-2, F
13	BISSEL (5001)	4,002	0	4,002	0	EPH				200	0	200		N/A			A,C,F,I-3	B-1, E-2, F
14	CANTIL COMMON (5005)	364,800	43,000	407,800	0	EPH				0–19,000	0–2,090	0–21,090		75	10	15	A,B,C-1, H,I-3	A-2, B-1, C-2/3, D-1/2, E-1/2, F
15	MONOLITH CANTIL (5007)	23,043	26,883	49,926	0	EPH				0–1,500	0–1,500	0–3,000			100		A,B,C-1, I-3	A-2, B-1, D-2, E-2, F
16	OAK CREEK (5015)	160	0	160	0	EPH/PER	16	0	16					N/A			A,F,I-3	B-1, E-2, F
17	RUDNICK COMMON (5008)	163,973	39,000	202,973	0	EPH/PER	12,000–26,000	2,864–6,183	14,864–32,183					98		2	A,B,C-3, I-3	A-1/4,B-1,C-2,D-2,E-1/2,F
18	WARREN (5002)	584	0	584	0	EPH/PER				55	0	55		N/A			A,F,I-3	B-1, E-2, F
19	WALKER PASS (0077)	75,000	0	75,000	0	EPH/PER	5,000	0	5,000					100			A,B,C-2, I-2	A-2, B-1, C-2, D-2, E-1/2, F
20	PAHRUMP VALLEY (5000)	12,286	0	12,286	0	EPH/PER	550	0	550				2	98			A,B,I 2/3	B-1, E-1/2, F
21	HANSON (5006)	32,000	32,000	64,000	0	EPH/PER	354	354	708	1,041	1,041	2,082		100			A,B,C-2, I-3	A-2, B-1, C-2, E-1/2, F
22	BORON SHEEP (7114)	4,714	2,768	7,482	0	EPH				0–200	0–74	0–274			100		A,C-1, F,I-1	A-2, B-1, C-1, E-2, F
23	BUCKHORN CYN (7103)	16,791	4,463	21,254	0	EPH				0–800	0–168	0–968			100		A,C-1, I-3	B-1, C-1, E-2, F
24	GOLDSTONE (7104)	9,006	0	9,006	0	EPH				0–200	0	0–200			100		A,C-1, F,H	B-1, C-1, E-2, F
25	GRANITE MTNS (7105)	5,714	0	5,714	0	EPH	NO	LONGER	LEASED						100		A	B-1, E-2, F
26	GRAVEL HILLS (7107)	65,598	63,025	128,623	0	EPH				0–1,500	0–735	0–2,235			100		A,C-1, I-3	A-2, B-1, C-1, E-1/2, F
27	HARPER LAKE (7119)	12,859	676	13,535	0	EPH/PER	1,000–2,000	50–100	1,050–2,100					25	25	navy 50	A,C-1, H	A-2, B-1, C-1/3, E-2, F
28	LAVA MTNS (7108)	16,830	0	16,830	0	EPH				0–	0	0–	90	10			A,B	A-2, B-1, E-2, F
29	PILOT KNOB (7106)	49,150	49,151	98,301	0	EPH	0–1,800	0–1,800	0–3,600					30	20	50	A,B,C-1,D,H,I-1	A-2, B-1, C-1/3, E-2, F
30	SHADOW MTNS (7113)	36,583	5,955	42,538	0	EPH				0–1,500	0–210	0–1,710		N/A			A,C-1, I 3	B-1, E-2, F
31	SPANGLER HILLS (7112)	66,899	0	66,899	440	EPH				0–1,000	0	0–1,000		50		50	A,C-1, H	A-2, B 1, E-2, F
32	STODDARD MTN (7114)	170,126	99,915	270,041	0	EPH				0–6,000	0–2,220	0–8,220			100		A,C-1, H, I-3	B 1, C-1/3, E-1/2, F
33	SUPERIOR VALLEY (7116)	167,648	29,584	197,232	0	EPH				0–2,500	0–475	0–2,875			100		A,B,C 1,H,I-3	A-2, B 1, C-2, E-1/2, F
34	VALLEY WELL (7117)	640	0	640	0	EPH/PER	24	0	24						100		A	B-1, C 1, E-2, F
35	NEWBERRY / ORD (6218)	24,049	11,317	35,366	0	EPH	1,200–2,400	384–768	1,584 3,168					100			A,B	A-5, B-1, C-1/3, E-1/2, F
36	RATTLESNAKE CYN (7111)	20,476	0	20,475	1,960	EPH/PER	1,200–2,000	0	1,200–2,000					100			A,B	B-1, C 1/3, E 2, F
37	WHITEWATER CYN (7118)	36,878	15,333	42,211	0	EPH/PER	768	276	1,043				20	80			A,B,C-2,D,H,I-3	B-1, C-1/3, E-2, F
38	AFTON CYN (7215)	41,825	41,825	83,650	0	EPH	0–1,000	0–1,000	0–2,000					40	60		A,B,C-2/3, H	B-1, C-3, E-1/2, F
39	CLARK MTN (7203)	71,359	4,300	75,659	0	EPH/PER	1,900–2,000	114–200	2,014–2,220					100			A,B,C-1/2/3,D,E,H	B-1/2, C-1/3, E 2, F
40	COLTON HILLS (7202)	143,888	43,800	187,688	53,310	EPH/PER	2,950–3,500	678–805	3,628–4,305				30	40	30		A,B,C-1/2/3,D,E,G	A-1/6,B-1/2,C-1/3,D-1,E-1/2
41	CRESCENT PEAK (7213)	31,201	0	31,201	383	EPH/PER	1,600–2,000	0	1,600–2,000				50	50			A,B,C-1/2/3,G,I-2	A-1, B-1/2, C-1/3, E-1/2, F
42	CRONESE LAKE (7219)	51,000	12,750	63,750	0	EPH	0–1,200	0–240	0–1,440					100			A,B,G	B-1, C-3, E 1/2, F
43	GRANITE MTN (7211)	276,176	48,686	324,861	0	EPH/PER	3,844	577	4,421				55	40	5		A,B,C-2/3,D,E,G,H	A 1/6, B-1/2, C-1, E-1/2, F
44	GOLO VALLEY (7212)	15,865	1,721	17,586	0	EPH/PER	1,380–1,500	14–15	1,394–1,515					100			A,C-2/3, D,E	A 1/6,B-1/2/4,C-3,E-2,F
45	HORSETHIEF SPRINGS (7207)	108,793	0	108,793	0	EPH/PER	2,418–3,000	0	2,418–3,000				30	30	40		A,B,C-2/3, H	B-1/2, C-1/3, E-2/4, F
46	KESSLER SPRINGS (7208)	233,872	19,346	253,218	0	EPH/PER	8,400–9,500	672–760	9,072–10,260				20	80			A,B,C-1/2, D,E	A 1/6, B 1/2, C-1/3, E-1/2
47	LANFAIR VALLEY (7210)	339,553	127,641	467,194	0	EPH/PER	13,000)–16,000	3,510–4,320	16,510–20,320				5	80	15		A,B,C-1/2/3,D,E,G,H,I	A 1/6,B-1/2,C-1/3, E-1/2
48	PIUTE VALLEY (7204)	33,468	4,810	38,278	0	EPH	0–180	0–23	0–203				10	90			A,B,C-1,D,E,G,H	A-1, B-1, C-1, E-2, F
49	ROUND VALLEY (7216)	670	3,530	4,200	0	EPH/PER	27	23	50				5	95			A,B	A 1, B-1, C-1/3, E-2, F
50	VALLEY VIEW (7200)	271,506	17,530	289,036	0	EPH/PER	8,800–10,400	528–624	9,328 11,024					80	20		A,B,C-1/2/3,D,E,H	A-1/6,B-1/2,C-1/3,D-2,E-1/2
51	VALLEY WELLS (7209)	237,258	5,970	243,228	0	EPH/PER	5,000–6,000	100–120	5,100–6,120				5	10	85		A,B,C-1/2/3,D,E,H	B-1/2, C-1/3, E-2, F
52	FORD DRY LAKE (7044)	19,089	0	19,089	0	EPH	0–1,500	0	0–1,500					100			A,B,H	B-1, E 2, F
53	JEAN LAKE (7217)	5,740	0	5,740	0	EPH/PER	312	0	312					90	10		A,C-1, I-2	B-1, C-1, E-2, F
54	LAZY DAISY (7220)	451,617	92,181	543,798	0	EPH/PER	2,500–3,150	425–536	2,925–3,686					100			A,B,C-1/2/3, H	B-1, C-1, E-2/4, F
55	SHEEP DRIVEWAY (5098)	23,040	0	23,040	0	EPH				0–1,000	0	0–1,000						

VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

① RANGE TYPE:
PER = Perennial
EPH = Ephemeral

⑩ DECISION CRITERIA:
These are the major factors influencing grazing allotment decisions.

A = Forage production surveys
B = Multipe Use class designations primarily Class C
C = Wildlife requirements
  1) Tortoise
  2) Big Game
  3) Listed and Sensitive Species
D = Burro populations (and wild horse)
E = Burro and Wild Horse management prescriptions
F = Land Tenure Adjustments
G = Future economic projection
H = Areas of Critical Environmental Concern (ACEC)
I = Boundary considerations.
  1) Other agencies (NPS, FS, DOD)
  2) CDCA boundaries (allotment extends outside CDCA)
  3) Extensive private land adjacent to public lands

⑪ DATA SOURCES USED TO PRODUCE THE RANGE ELEMENT CHARTS
A = Vegetation and Range Surveys
  1) URA-MFP East Mojave 1976
  2) URA-MFP El Paso / Red Mountain 1975
  3) Adjudication COSD 1966
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  5) Turtle Mountains vegetative survey 1978
F = Professional observations and evaluations

VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

● USE ALTERNATIVE ●

Allotments		Acres				①	Livestock Forage Allocation AUM's						Multiple Use Class				⑩	⑪
						Range Type	Cattle			Sheep			Distribution (% OF ALLOTMENT)				Decision Criteria	Data Sources
MAP NUMBER	NAME (BLM NUMBER)	PUBLIC	PRIVATE and MILITARY EXCHANGE OF USE	TOTAL	OTHER		PUBLIC	EXCHANGE OF USE	TOTAL	PUBLIC	EXCHANGE OF USE	TOTAL	C	L	M	I		
1	FISHLAKE VALLEY (6003)	1,482	0	1,482	0	PER	52	0	52						100		A,B	B-1, E-2, F
2	BAR 99 (6001)	13,671	0	13,671	0	PER	307	0	307						100		A,B,E, I-2	B-1, C-1, E-2, F
3	DEEP SPRINGS (6005)	43,028	0	43,028	0	EPH/PER	1,250	0	1,250						100		A,B,C-2,E	B-1, C-3, E-1/2, F
4	LAST CHANCE (6004)	94,711	0	94,711	0	EPH/PER	3,235	0	3,325					50	50		A,B,C-2, E, I-2	B-1, C-3, E-1/2, F
5	OASIS RANCH (6000)	22,894	0	22,894	0	PER	656	0	656						100		A,B,C-2,E	B-1, C-3, E-2, F
6	SOUTH OASIS (6006)	10,884	0	10,884	0	PER	429	0	429					100			A,B,E	B-1, C-3, E-2, F
7	DARWIN (5010)	1,928	0	1,928	0	PER	43	0	43						100		A,B,D,E	A-3, B-1, D-3, E-2, F
8	HUNTER MTN (5013)	55,210	0	55,210	0	PER	1,105	0	1,105					100			A,B,C-2, D,E	A-3, B-1, D-1, E-1/2, F
9	LACY-CACTUS-McCLOUD (6012)	36,560	382,000	418,560	0	PER	455	4,094	4,549						40	navy 60	A,B,C-2, D,E,I-1	A-1/3, B-1/3, D-1, E-1/2, F
10	OLANCHA COMMON (6011)	14,540	0	14,540	0	PER	702	0	702						100		A,B,C-2	A-3, B-1, D-2, E-2, F
11	TUNAWEE COMMON (5009)	30,016	12,864	42,880	0	PER	1,314	563	1,877	54	23	77		20	15	navy 65	A,B,C-2, E,I-1	A-1/3, B-1, D-2, E-1/2, F
12	ANTELOPE VALLEY (5004)	6,500	0	6,500	0	EPH/PER				325	0	325		N/A			A,F,I-3	B-1, C-3, E-2, F
13	BISSEL (5001)	4,002	0	4,002	0	EPH				200	0	200		N/A			A,C,F,I-3	B-1, E-2, F
14	CANTIL COMMON (5005)	364,800	43,000	407,800	0	EPH				0–19,000	0–2,090	0–21,090			100		A,B,C-1, H,I-3	A-2,B-1,C-2/3,D-1/2,E-1/2,F
15	MONOLITH CANTIL (5007)	23,043	26,883	49,926	0	EPH				0–1,500	0–1,500	0–3,000			100		A,B,C-1, I-3	A-2, B-1, D-2, E-2, F
16	OAK CREEK (5015)	160	0	160	0	EPH/PER	16	0	16					N/A			A,F,I-3	B-1, E-2, F
17	RUDNICK COMMON (5008)	163,973	39,000	202,973	0	EPH/PER	12,000–26,000	2,864–6,183	14,864–32,183						100		A,B,C-3, I-3	A-2/4, B-1, C-2, D-2, E-1/2, F
18	WARREN (5002)	584	0	584	0	EPH/PER				55	0	55		N/A			A,F,I-3	B-1, E-2, F
19	WALKER PASS (0077)	75,000	0	75,000	0	EPH/PER	5,000	0	5,000					95	5		A,B,C-2, I-2	A-2, B-1, C-2, D-2, E-1/2, F
20	PAHRUMP VALLEY (5000)	12,286	0	12,286	0	EPH/PER	550	0	550						100		A,B,I-2/3	B-1, E-1/2, F
21	HANSON (5006)	32,000	32,000	64,000	0	EPH/PER	354	354	708	1,041	1,041	2,082	2		98		A,B,C-2, I-3	A-2, B-1, C-2, E-1/2, F
22	BORON SHEEP (7114)	4,714	2,768	7,482	0	EPH				0–200	0–74	0–274			100		A,C-1, F,I-3	A-2, B-1, C-1/3, E-2, F
23	BUCKHORN CYN (7103)	16,791	4,463	21,254	0	EPH				0–800	0–168	0–968			100		A,C-1, I-3	B-1, C-1, E-2, F
24	GOLDSTONE (7104)	9,006	0	9,006	0	EPH				0–200	0	0@ 200			100		A,C-1, F,H	B-1, C-1, E-2, F
25	GRANITE MTNS (7105)	5,714	0	5,714	0	EPH		N/A			N/A			N/A				
26	GRAVEL HILLS (7107)	65,598	63,025	128,623	0	EPH				0–1,500	0–235	0–2,235			100		A,C-1, I-3	A-2, B-1, C-1, E-1/2, F
27	HARPER LAKE (7119)	12,859	676	13,535	0	EPH/PER	1,000–3,000	50–150	1,050–3,150					N/A			A,C-1, H	A-2, B-1, C-1, E-1/2, F
28	LAVA MTNS (7108)	16,830	0	16,830	0	EPH				0–500	0	0–500		100			A-2, B-1	A-2, B-1, E-2, F
29	PILOT KNOB (7106)	49,150	49,151	98,301	0	EPH	0–1,800	0–1,800	0–3,600						50	navy 50	A,C-1, D,H,I-1	A-2, B-1, C-1/3, E-2, F
30	SHADOW MTNS (7113)	36,583	5,955	42,538	0	EPH				0–1,500	0–210	0–1,710			100		A,C-1, I-3	B-1, E-2, F
31	SPANGLER HILLS (7112)	66,899	0	66,899	440	EPH				0–1,000	0	0–1,000		50	50		A-1, C-1, H	A-2, B-1, E-2, F
32	STODDARD MTN (7114)	170,126	99,915	270,041	0	EPH				0–6,000	0–2,220	0–8,220			10	90	A,C-1, H-I-3	B-1, C-1/3, E-1/2, F
33	SUPERIOR VALLEY (7116)	167,648	29,584	197,232	0	EPH				0–2,500	0–375	0–2,875			100		A,C-1, H,I-3	A-2, B-1, C-2, E-1/2, F
34	VALLEY WELL (7117)	640	0	640	0	EPH/PER	24	0	24							100	A-1	B-1, C-1, E-2, F
35	NEWBERRY / ORD (6218)	24,049	11,317	35,366	0	EPH	1,200–2,400	384–768	1,584–3,168					15	35	50	A,B	A-5, B-1, C-1/3, E-1/2, F
36	RATTLESNAKE CYN (7111)	20,475	0	20,475	1,960	EPH/PER	1,200–2,000	0	1,200–2,000					100			A,B	B-1, C-1/3, E-2, F
37	WHITEWATER CYN (7118)	36,878	15,333	42,211	0	EPH/PER	768	276	1,043					100			A,C-2,D,H,I-3	B-1, C-1/3, E-2, F
38	AFTON CYN (7215)	41,825	41,825	83,650	0	EPH	0–1,020	0–1,020	0–2,040						60	40	A,C-2/3, H	B-1, C-3, E-1/2, F
39	CLARK MTN (7203)	71,359	4,300	75,659	0	EPH/PER	1,900–2,000	114–200	2,0–4–2,200					10	90		A,C-1/2/3, D,E,H	B-1/2, C-1/3, E-2, F
40	COLTON HILLS (7202)	143,888	43,800	187,688	53,310	EPH/PER	3,009–3,570	692–821	3,701–4,391					10	90		A,C-1/2/3,D,E,G	A-1/,B-1/2,C-1/3,D-2,E-1/2,F
41	CRESCENT PEAK (7213)	31,201	0	31,201	383	EPH/PER	1,600–2,000	320–400	1,920–2,400						100		A,C-1/2/3,G,I-2	A-1, B-1/2, C-1/3, E-1/2, F
42	CRONESE LAKE (7219)	51,000	12,750	63,750	0	EPH	0–1,225	0–245	0–1,470						100		A,G	A-1, B-1, C-3, E-1/2, F
43	GRANITE MTN (7211)	276,175	48,686	324,861	0	EPH/PER	3,844	577	4,421				15	20	30	35	A,B,C-2/3,E,G,H	A-1/6,B-1/2,C-1, E-1/2, F
44	GOLD VALLEY (7212)	15,865	1,721	17,586	0	EPH/PER	1,380–1,500	14–15	1,394–1,515						100		A,C-2/3, D,E	A-1/6,B-1/2/4, C-3, E-2, F
45	HORSETHIEF SPRINGS (7207)	108,793	0	108,793	0	EPH/PER	2,466–3,060	0	1,466–3,060				10		50	40	A,B,C-2/3,H	B-1/2, C-1/3, E-2/4, F
46	KESSLER SPRINGS (7208)	233,872	19,346	253,218	0	EPH/PER	8,577–9,690	686–775	9,263–10,465					10	90		A,C-1/2, D,E	A-1/6,B-1/2,C-1/3,E-1/2,F
47	LANFAIR VALLEY (7210)	339,553	127,641	467,194	0	EPH/PER	13,000–16,000	3,510–4,320	16,510–20,320					10	85	(L.T.) 5	A,C-1/2/3,D,E,G,H,I-3	A-1/6,B-1/2,C-1/3,E-1/2, F
48	PIUTE VALLEY (7204)	33,468	4,810	38,278	0	EPH	0–180	0–23	0–203						100		A,C-1, D,E,G,H	A-1, B-1, C-2, F
49	ROUND VALLEY (7216)	670	3,530	4,200	0	EPH/PER	27	23	50						100		A	A-1, B-1, C-1/3, E-2, F
50	VALLEY VIEW (7200)	271,506	17,530	289,036	0	EPH/PER	9,328–11,024	560–861	9,798–11,885						100		A,C-1/2/3,	A-1/6,B-1/4,C-1/3,D-2,E-1/2,F
51	VALLEY WELLS (7209)	237,258	5,970	243,228	0	EPH/PER	5,250–6,300	105–126	5,355–6,426						100		A,C-1/2/3,D,E,H	B-1/2, C-1/3, E-2, F
52	FORD DRY LAKE (7044)	19,089	0	19,089	0	EPH	0–1,500	0	0–1,500							100	A,H	B-1, E-2, F
53	JEAN LAKE (7217)	5,740	0	5,740	0	EPH/PER	312	0	312						100		A,C-1, I-2	B-1, C-1, E-2, F
54	LAZY DAISY (7220)	451,617	92,181	543,798	0	EPH/PER	2,650–3,213	434–546	2,984–3,759						100		A,B,C-1/2/3, H	B-1, C-1, E-2/5, F
55	SHEEP DRIVEWAY (5098)	23,040	0	23,040	0	EPH				0–1,000	0	0–1,000		N/A				

VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

① RANGE TYPE.
- PER = Perennial
- EPH = Ephemeral

⑩ DECISION CRITERIA.

These are the major factors influencing grazing allotment decisions.

- A = Forage production surveys
- B = Multiple Use class designations - primarily Class C
- C = Wildlife requirements:
  - 1) Tortoise
  - 2) Big Game
  - 3) Listed and Sensitive Species
- D = Burro populations (and wild horse)
- E = Burro and Wild Horse management prescriptions
- F = Land Tenure Adjustments
- G = Future economic projection
- H = Areas of Critical Environmental Concern (ACEC)
- I = Boundary considerations:
  - 1) Other agencies (NPS, FS, DOD)
  - 2) CDCA boundaries (allotment extends outside CDCA)
  - 3) Extensive private land adjacent to public lands

⑪ DATA SOURCES USED TO PRODUCE THE RANGE ELEMENT CHARTS:

- A = Vegetation and Range Surveys:
  - 1) URA-MFP East Mojave 1976
  - 2) URA-MFP El Paso / Red Mountain 1975
  - 3) Adjudication COSO 1966
  - 4) Rudnick survey 1970
  - 5) Ord Mountain survey 1977
  - 6) East Mojave Range survey 1969
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  - 1) Actual use records
  - 2) Trend plots for East Mojave
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  - 4) AMP Southcott
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  - 2) Allotment review - Bakersfield District 1979
  - 3) UC Extension Service questionnaire 1979
- D = Comparison Areas.
  - 1) Exclosure
  - 2) Highway Right-of-Way
  - 3) Relic areas (little grazed)
- E = CDCA Inventory:
  - 1) Large scale aerial transects
  - 2) Satellite spectral class designations
  - 3) Lucerne Valley vegetative survey 1978
  - 4) Kingston Mountains vegetative survey 1978
  - 5) Turtle Mountains vegetative survey 1978
- F = Professional observations and evaluations

PROPOSED MANAGEMENT PRACTICES PRESCRIBED

MAP NUMBER	Allotments NAME (BLM NUMBER)	Acres PUBLIC	Acres EXCHANGE OF USE	Acres TOTAL	❶ Range Type PROPOSED	❷ Type of AMP	❸ Season of Use	❹ Forage Readiness	❺ Maximum Allowable Utilization	❻ Monitoring and Adjustment	❼ Regulations for Concentration Areas Watering	❼ Regulations for Concentration Areas Handling	❽ Ear Tags	Prescribed New Range Improvements: Water Source Development Springs	Wells	Catchments	Water Distribution Pipeline (miles)	Troughs	Fencing Boundary (miles)	Fencing Pasture (miles)	Multiple Use Class Distribution (% OF ALLOTMENT) C	L	M	I	❿ Decision Criteria	⓫ Data Sources
	PROTECTION ALTERNATIVE																									
56	TECOPA	96,000	0	96,000	EPH	N	Y	Green-Up	A,B	1,4,5,B	W-2	H-1	Y								85	15			B	
57	RATTLESNAKE CYN ANNEX	18,000	0	18,000	EPH	M	Y	200 lbs	A	2,4,5,AB	W-2		N	1			2	2	6	3	100				B	
58	JOHNSON VALLEY	115,000	0	115,000	EPH		SP	200 lbs	B,C	2,4,5,A	W-1	H-1,2,3	N								20	20	20	40	A,B,C,F,I-3	B-1, C-1/3, E-2, F
59	LUDLOW	44,000	0	44,000	EPH		SP	200 lbs	B	2,4,5,A	W-1	H-1,2,3	N								5	95			B, I-3	B-1, E-2, F
60	ROUND MTN	14,000	0	14,000	EPH	M	Y	200 lbs	A,B	2,4,5,AB	W-2		N	2			5	3	15			100				B-1, O-3, E-2/3, F
61	CHEMEHUEVI	70,000	0	70,000	EPH/PER	N	SP	200 lbs	B,C	2,4,5,A	W-2		Y								15	85			A,B,C,O,E	A-1/6, B-1, E-2
62	RICE VALLEY	40,000	0	40,000	EPH		SP	200 lbs	B	2,4,5,A	W-1	H-1,2	N								60	40			B	
63	PALEN	67,000	0	67,000	EPH		SP	200 lbs	B	2,4,5,A	W-1	H-1,2	N								80	20			B	
64	FORD DRY LAKE ANNEX	38,400	0	38,400	EPH		SP	200 lbs	B	2,4,5,A	W-1	H-1,2	N								35	65			A,B,D,I-3	B-1, C-1, E-2, F
65	HOMEWOOD CYN	14,000	0	14,000	EPH	N	SP	200 lbs	B	1,4,5,A	W-1	H-1,2,3	N								20	80			D,E	A-2, B-1, C-2, E-2, F
66	DEATH VALLEY JCTN	23,000	0	23,000	EPH	N	SP,SM,W	Green-Up	A,B	1,4,5,A	W-2	H-1	N									100			I-2	B-1, C-2, E-2, F
67	LATHROP WELL	9,500	0	9,500	EPH/PER	N	SP,SM,W	Green-Up	A,B	1,4,5,A	W-2	H-1	Y									100			I-2	B-1, C-2, E-2, F
68	GRANITE MTN ANNEX	24,000	0	24,000	EPH/PER		SP	200 lbs	B	2,4,5,A	W-2		Y	1					6			100			H	B-1, C-1/3, E-2, F
	TOTAL	572,900	0	572,900										4			7	5	27	3						
	BALANCED ALTERNATIVE																									
56	TECOPA	96,000	0	96,000	EPH	N													10		1	69	30		H-2, I-3	B-1, C-2, E-2, F
57	RATTLESNAKE CYN ANNEX	18,000	0	18,000	EPH	M	Y	200 lbs	A	2,4,5,AB	W-2		N	2			4	4	12	6		100				B-1, C-1/3, E-2, F
58	JOHNSON VALLEY	115,000	0	115,000	EPH	L	SP	200 lbs	B,C	2,4,5,A	W-1	H-1,2,3	N								20	12	18	50	A,B,C-1,F,I-3	B-1, E-1/2/3, F
59	LUDLOW	44,000	0	44,000	EPH	N	SP	200 lbs	B	2,4,5,A	W-1	H-1,2,3	N										100		I-3	B-1, E-2, F
60	ROUND MTN	14,000	0	14,000	EPH	M	Y	200 lbs	A,B	2,4,5,AB	W-2		N	2			5	3	15			40	60			B-1, D-3, E-2, F
61	CHEMEHUEVI	70,000	0	70,000	EPH/PER	N	SP	200 lbs	B,C	2,4,5,A	W-2		Y								50	50			A,B,C-1, O,E,G	A-1/6, B, E-2, F
62	RICE VALLEY	40,000	0	40,000	EPH	N																20	80		H	B-1, C-1, E-2, F
63	PALEN	67,000	0	67,000	EPH	N															40	25	35			B-1, C-1, E-2, F
64	FORD DRY LAKE ANNEX	38,400	0	38,400	EPH	N	SP	200 lbs	B,C	2,4,5,A	W-1	H-1,2,3	N		1	1						5	95		A,D,I-3	B-1, C-1, E-2, F
65	HOMEWOOD CYN	14,000	0	14,000	EPH	N	SP	200 lbs	B,C	1,4,5,A	W-1	H 1,2,3	N									80	20		D,E	A-2, B-1/2, C-2, E-2, F
66	DEATH VALLEY JCTN	23,000	0	23,000	EPH	N	SP,SM,W	Green-Up	A,B	1,4,5,A	W-2	H-1	N									10	90		I-2	B-1, C-2, E-2, F
67	LATHROP WELL	9,500	0	9,500	EPH/PER	N	SP,SM,W	Green-Up	A,B	1,4,5,A	W-2	H-1	Y									100			I-2	B-1, C-2, e-2, F
68	GRANITE MTN ANNEX	24,000	0	24,000	EPH/PER	I	SP	200 lbs	B	2,4,5,A	W-2		Y	1					6				100		H	B-1, C-1/3, E-2, F
	TOTAL	572,900	0	572,900										5	1	1	9	7	43	6						
	USE ALTERNATIVE																									
56	TECOPA	96,000	0	96,000	EPH	N	Y	Green-Up	A,B	1,4,5,B	W-2	H 1	Y						12			2	68	30	H, I	B-1, C-2, E-2, F
57	RATTLESNAKE CYN ANNEX	18,000	0	18,000	EPH	M	Y	200 lbs	A	2,4,5,AB	W-2		N	2			4	4	15	6		100				B-1, C-1/3, E-2, F
58	JOHNSON VALLEY	115,000	0	115,000	EPH	N	SP	200 lbs	B	2,4,5A	W-1	H-1,2	N									20	18	62	A,B,C-1,F,I-3	B-1, E-1/2/3, F
59	LUDLOW	44,000	0	44,000	EPH	N	SP	200 lbs	B	2,4,5,A	W-1	H 1,2	N										100		I-3	B-1, E-2, F
60	ROUND MTN	14,000	0	14,000	EPH	M	Y	200 lbs	A,B	2,4,5,AB	W-2		N	2			5	3	15				100			B-1, E-2/3, O-3, F
61	CHEMEHUEVI	70,000	0	70,000	EPH/PER	N	SP	200 lbs	B	2,4,5,A	W-2		Y								5		95		A,B,C,D,E	A-1/6, B-1, E-2
62	RICE VALLEY	40,000	0	40,000	EPH	N	SP	200 lbs	B	2,4,5,A	W-1	H-1,2	N										100		H	B-1, C-1, E-2, F
63	PALEN	67,000	0	67,000	EPH	N	SP	200 lbs	B	2,4,5,A	W-1	H-1,2	N										95	5		B-1, C-1, E-2, F
64	FORD DRY LAKE ANNEX	38,400	0	38,400	EPH	N	SP	200 lbs	B	2,4,5,A	W-1	H-1,2	N		1	1						5		95	A,D,I-3	B-1, C-1, E-2, F
65	HOMEWOOD CYN	14,000	0	14,000	EPH	N	SP	200 lbs	B	1,4,5,A	W-1	H-1,2,3	N										100		D,E	A-2, B-1, C-2, E-2, F
66	DEATH VALLEY JCTN	23,000	0	23,000	EPH	N	SP,SM,W	Green-Up	A,B	1,4,5,A	W-2	H-1	N										100		I-2	B-1, C-2, E-2, F
67	LATHROP WELL	9,500	0	9,500	EPH/PER	N	SP,SM,W	Green-Up	A,B	1,4,5,A	W-2	H-1	Y													B-1, C-2, E-2, F
68	GRANITE MTN ANNEX	24,000	0	24,000	EPH/PER	I	SP	200 lbs	B	2,4,5,A	W-2		Y	1					6				100		H	B-1, C-1/3, E-2, F
	TOTAL	572,900	0	572,900										5	1	1	9	7	48	6						

MANAGEMENT PRACTICES PRESCRIBED

❶ RANGE TYPE:
PER = Perennial
EPH = Ephemeral

❷ TYPE AMP (Allotment Management Plan):
I = INTENSIVE:
Strict and detailed schedule of defferred rotational systems
M = MODERATE:
Management system imposed, but does not include strict rotational system
N = NON-INTENSIVE:
No psture restriction other than distribution of livestock according to availability of forage and water
R = INTENSIVE:
Strict and detailed schedule of rest-rotational systems

❸ SEASON OF USE:
SP = Spring
SM = Summer
F = Winter
W = Year-round

❹ FORAGE READINESS:
This will be judged on the basis of forage plant phenology and will be employed for determining turnout dates and pasture shifts
Green Up = Early flowering of key species
Dormant = Plant growth generally inactive
200 lbs = When 200 lbs of dry weight production of ephemerals is present or reasonably anticipated on selected sites

❺ MAXIMUM ALLOWABLE UTILIZATION OF KEY SPECIES:
A = 40 - 50% use of new growth of key forage species
B = 50% use of ephemeral production and depletion of supporting soil moisture
C = 25% use of ephemeral production and depletion of soil moisture

❻ MONITORING AND ADJUSTMENTS:
Monitoring:
1) Transects or utilization plots
2) Transect and utilization plos
3) Transect and utilization plots and exclosures
4) Annual production plots
5) Livestock monitoring or actual use

Adjustments:
A) Stocking rates determined each growing year
B) Every fifth year, permanent plot data for perennial plant cover (transects and exclosures) will be reviewed to determine if adjustments in the yearly stocking rate formulas are needed to achieve desired production on a sustained yield basis
C) Evaluation of all trend and condition plot data after each grazing cycle. Modify grazing program when needed to meet condition, trend, and production objectives

❼ WATERING AND HANDLING:
Watering:
W 1) Non-permanent; designated critical areas to be avoided
W 2) Permanent designated areas
Handling.
H 1) Open herding
H 2) 1 mile buffer - roadways designated annually
H 3) Designated areas for loading and unloading

❽ EAR TAGS:
The use of ear tagging may be needed for some allotments
N) Ear tagging will not occur
Y) Ear tagging will occur

❿ DECISION CRITERA
These are the major factors influencing grazing allotment decisions
A = Forage production surveys
B = Multiple use class designations - primarily Class C
C = Wildlife requirements:
1) Tortoise
2) Big game
3) Listed and Sensitive Species
D = Burro populations (and wild horse)
E = Burro and Wild Horse Management prescriptions
F = Land Tenure Adjustments
G = Future economic projection
H = Areas of Critical Environmental Concern (ACEC)
I = Boundary considerations:
1) Other agencies (NPS, FS, DOD)
2) CDCA boundaries (allotment extends outside the CDCA)
3) Extensive private land adjacent to public lands

⓫ DATA SOURCES USED TO PRODUCE THE RANGE ELEMENT CHARTS:
A = Vegetation and Range Surveys:
1) URA-MFP East Mojave 1976
2) URA MFP El Paso/Red Mtn 1875
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4) Kingston Mtns vegetative survey 1878
5) Turtle Mtns vegetative survey 1978
F = Professional observations and evaluations

PROPOSED
VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

Map Number	Allotments NAME (BLM NUMBER)	Acres PUBLIC	Acres PRIVATE and MILITARY EXCHANGE OF USE	Acres TOTAL	Acres OTHER	❶ Range Type	Livestock Forage Allocation AUM's Cattle PUBLIC	Cattle EXCHANGE OF USE	Cattle TOTAL	Sheep PUBLIC	Sheep EXCHANGE OF USE	Sheep TOTAL	Multiple Use Class Distribution (% OF ALLOTMENT) C	L	M	I	❿ Decision Criteria	⓫ Data Sources
	PROTECTION ALTERNATIVE																	
57	TECOPA	96,000	0	96,000		EPH							85	15			B	
58	RATTLESNAKE CYN ANNEX	18,000	0	18,000		EPH/PER	0	0	0				100				B	
59	JOHNSON VALLEY	115,000	0	115,000		EPH				0–27,200	0	0–27,200	20	20	20	40	A,B,C,F,G,I-3	B-1, C-1/3, E-2, F
60	LUOLOW	44,000	0	44,000		EPH				0–3,000	0	0–3,000	5	95			B,G,I-3	B-1, E-2, F
61	ROUNO MTN	14,000	0	14,000		EPH/PER	400–500	0	400–500	400–500	0	400–500		100			G	B-1, O-3, E-2, F
62	CHEMEHUEVI	70,000	0	70,000		EPH				0–9,000	0	0–9,000	15	85			A,B,C,O,E,G	A-1/6, B-1, E-2
63	RICE VALLEY	40,000	0	40,000		EPH							60	40			B	
64	PALEN	67,000	0	67,000		EPH							80	20			B	
65	FORO ORY LAKE ANNEX	38,400	0	38,400		EPH				0–1,500	0	0–1,500	35	65			A,B,O,G,I-3	A-2, B-1, C-2, E-2, F
66	HOMEWOOD CYN	14,000	0	14,000		EPH				0–700	0	0–700	20	80			D,E,G	A-2, B-1, C-2, E-2, F
67	DEATH VALLEY JCTN	23,000	0	23,000		EPH/PER	500	0	500					100			G, I-2	B-1, C-2, E-2, F
68	LATHROP WELL	9,500	0	9,500		EPH/PER	300	0	300					100			G, I-2	B-1, C-2, E-2, F
69	GRANITE MTN ANNEX	24,000	0	24,000		EPH	0–4,000	0	0–4,000					100			G,H	B-1, C-1/3, E-2, F
	BALANCED ALTERNATIVE																	
57	TECOPA	96,000	0	96,000		EPH	0–400	0	0–400				1	69	30		G,H-2, I-3	B-1, C-2, E-2, F
58	RATTLESNAKE CYN ANNEX	18,000	0	18,000		EPH/PER	360–450	0	360–450					100			G	B-1, C-1/3, E-2, F
59	JOHNSON VALLEY	115,000	0	115,000		EPH				0–32,000	0	0–32,000	20	12	18	50	A,B,C-1,F,G,I-3	B-1, E-1/2/3, F
60	LUOLOW	44,000	0	44,000		EPH				0–3,000	0	0–3,000			100		G, I-3	B-1, E-2, F
61	ROUNO MTN	14,000	0	14,000		EPH/PER	0–500	0	0–500	0–500	0	0–500		40	60		G	B-1, D-3, E-2, F
62	CHEMEHUEVI	70,000	0	70,000		EPH				0–9,000	0	0–9,000	50	50			A,B,C-1, O,E,G	A-1/6, B, E-2, F
63	RICE VALLEY	40,000	0	40,000		EPH				0–4,000	0	0–4,000		20	80		G,H	B-1, C-1, E-2, F
64	PALEN	67,000	0	67,000		EPH				0–4,000	0	0–4,000	40	25	35		G	B-1, C-1, E-2, F
65	FORO DRY LAKE ANNEX	38,400	0	38,400		EPH				0–2,000	0	0–2,000		5	95		A,O,G,I-3	B-1, C-1, E-2, F
66	HOMEWOOO CYN	14,000	0	14,000		EPH				0–800	0	0–800		80	20		O,E,G	A-2, B-1/2, C-2, E-2,
67	DEATH VALLEY JCTN	23,000	0	23,000		EPH/PER	0–200	0	0–200					10	90		G, I-2	B-1, C-2, E-2, F
68	LATHROP WELL	9,500	0	9,500		EPH/PER	0–150	0	0–150					100			G, I-2	B-1, C-2, E-2, F
69	GRANITE MTN ANNEX	24,000	0	24,000		EPH	0–4,000	0	0–4,000						100		G,H	B-1, C-1/3, E-2, F
	USE ALTERNATIVE																	
57	TECOPA	96,000	0	96,000		EPH	0–400	0	0–400					2	68	30	G,H,I	B-1, C-2, E-2, F
58	RATTLESNAKE CYN ANNEX	18,000	0	18,000		EPH/PER	360–450	0	360–450					100			G	B-1, C-1/3, E-2, F
59	JOHNSON VALLEY	115,000	0	115,000		EPH				0–32,000	0	0–32,000		20	18	62	A,B,C-1,F,G,I-3	B-1, E-1/2/3, F
60	LUDLOW	44,000	0	44,000		EPH				0–3,000	0	0–3,000			100		G, I-3	B-1, E-2, F
61	ROUNO MTN	14,000	0	14,000		EPH/PER	0–500	0	0–500	0–500	0	0–500			100		G	B-1, O-3, E-2/3, F
62	CHEMEHUEVI	70,000	0	70,000		EPH				0–9,000	0	0–9,000	5		95		A,B,C,D,E,G	A-1/6, B-1, E-2
63	RICE VALLEY	40,000	0	40,000		EPH				0–4,000	0	0–4,000			100		G,H	B-1, C-1, E-2, F
64	PALEN	67,000	0	67,000		EPH				0–4,000	0	0–4,000			95	5	G	B-1, C-1, E-2, F
65	FORO ORY LAKE ANNEX	38,400	0	38,400		EPH				0–2,000	0	0–2,000		5		95	A,D,G,I-3	B-1, C-1, E-2, F
66	HOMEWOOD CYN	14,000	0	14,000		EPH				0–800	0	0–800			100		O,E,G	A-1, B-1, C-2, E-2, F
67	DEATH VALLEY JCTN	23,000	0	23,000		EPH/PER	0–200	0	0–200						100		G, I-2	B-1, C-2, E-2, F
68	LATHROP WELL	9,500	0	9,500		EPH/PER	0–150	0	0–150								G, I-2	B-1, C-2, E-2, F
69	GRANITE MTN ANNEX	24,000	0	24,000		EPH	0–4,000	0	0–4,000						100		G,H	B-1, C-1/3, E-2, F

VEGETATIVE PRODUCTION AND FORAGE ALLOCATION

❶ RANGE TYPE:
PER = Perennial
EPH = Ephemeral

❿ DECISION CRITERA:
These are the major factors influencing grazing allotment decisions
A = Forage production surveys
B = Multiple use class designations - primarily Class C
C = Wildlife requirements:
    1) Tortoise
    2) Big game
    3) Listed and Sensitive Species
O = Burro populations (and wild horse)
E = Burro and Wild Horse Management prescriptions
F = Land Tenure Adjustments
G = Future economic projection
H = Areas of Critical Environmental Concern (ACEC)
I = Boundary considerations:
    1) Other agencies (NPS, FS, OOO)
    2) COCA boundaries (allotment extends outside the COCA)
    3) Extensive private land adjacent to public lands

⓫ DATA SOURCES USED TO PRODUCE THE RANGE ELEMENT CHARTS:
A = Vegetation and Range Surveys:
    1) URA-MFP East Mojave 1976
    2) URA-MFP El Paso/Red Mtn 1975
    3) Adjudication COSO 1966
    4) Rudnick Survey 1970
    5) Ord Mtn Survey 1977
    6) East Mojave Range Survey 1969
B = Allotment files:
    1) Actual use records
    2) Trend plots for East Mojave
    3) Trend plots for Naval Weapons Center
    4) AMP Southcott
C = Special reports and interviews:
    1) Allotment review - Riverside District 1979
    2) Allotment review - Bakersfield District 1979
    3) UC Extension Service questionnaire 1979
D = Comparison areas:
    1) Exclosure
    2) Highway right-of-way
    3) Relic areas (little grazed)
E = COCA Inventory:
    1) Large scale aerial transects
    2) Satellite spectral class designations
    3) Lucerne Valley vegetative survey 1978
    4) Kingston Mtns vegetative survey 1978
    5) Turtle Mtns vegetative survey 1978
F = Professional observations and evaluations

APPENDIX 3a

Fish of the CDCA Watersheds

Common Name	Scientific Name
Threadfin Shad	Dorosoma petenense
Rainbow Trout	Salmo gairdneri
Carp	Cyprinus carpio
Goldfish	Carassius auratus
Golden Shiner	Notemigonus crysoleneas
Tui (Mohave) Chub	Gila bicolor mohavensis
Arroyo Chub	Gila orcutti
Speckled Dace	Rhinichythys osculus
Red Shiner	Notropis lutrensis
Fathead Minnow	Pimephales promelas
Humpback Sucker	Xyrauchen texanus
Channel Catfish	Ictalurus punctatus
Yellow Bullhead	Ictalurus natalis
Brown Bullhead	Ictalurus nebulosus
Black Bullhead	Ictalurus melas
Flathead Catfish	Pylodictis olivaris
Trinidad Rivulus	Rivulus harti
Desert Pupfish	Cyprinodon macularis
Amargosa Pupfish	Cyprinodon nevadensis
Saltcreek Pupfish	Cyprinodon salinus
Cottonball Marsh Pupfish	Cyprinodon milleri
Mosquitofish	Gambusia affinis
Sailfin Molly	Poecilia latipinna
Shortfin Molly	Poecilia mexicana
Variable Platyfish	Xiphophorus variatus
Striped Bass	Morone saxatilis
White Bass	Morone chrysops
Black Crappie	Pomoxis nigromaculatus
White Crappie	Pomoxis annularis
Warmouth	Lepomis gulosus
Green Sunfish	Lepomis cyanellus
Bluegill	Lepomis macrochirus
Redear Sunfish	Lepomis microlophus
Largemouth Bass	Micropterus salmoides
Smallmouth Bass	Micropterus dolomieui
Mozambique Mouthbrooder	Tilapia mossambica
Zill's Cichlid	Tilapia zillii
Striped Mullet	Mugil cephalus
Spotted Sleeper	Eleotris picta
Longjaw Mudsucker	Gillichthys mirabilis
Bairdella	Bairdella icistia
Orangemouth Corvina	Cynoscion xanthulus
Sargo	Anistremus davidsoni

APPENDIX 3b
Birds Observed within the CDCA

Common Name	Scientific Name
Common Loon	*Gavia immer*
Arctic Loon	*Gavia arctica*
Horned Grebe	*Podiceps auritus*
Eared Grebe	*Podiceps nigricollis*
Western Grebe	*Aechmophorus occidentalis*
Pied-billed Grebe	*Podilymbus podiceps*
Sooty Shearwater	*Puffinus griseus*
New Zealand Shearwater	Puffinus bulleri
Laysan Albatross	*Diomedea immutabulis*
Leach's Storm-petrel	*Oceanodroma melania*
Least Storm-petrel	*Halocyptena microsoma*
Red-billed Tropicbird	*Phaethon aethereus*
White Pelican	*Pelecanus erythrorhynchos*
Brown Pelican	*Pelecanus occidentalis*
Blue-footed Booby	*Sula nebouxii*
Brown Booby	*Sula leucogaster*
Double-crested Cormorant	*Phalacrocorax auritus*
Magnificent Frigatebird	*Fregata magnificens*
Great Blue Heron	*Ardea herodias*
Green Heron	*Butorides striatus*
Little Blue Heron	*Florida caerulea*
Cattle Egret	*Bubulcus ibis*
Great Egret	*Casmerodius albus*
Reddish Egret	*Dichromanassa rufescens*
Snowy Egret	*Egretta thula*
Louisiana Heron	*Hydranassa tricolor*
Black-crowned Night Heron	*Nycticorax nycticorax*
Least Bittern	*Ixobrychus exilis*
American Bittern	*Botaurus lentiginosus*
Wood Stork	*Mycteria americana*
White-faced Ibis	*Plegadis chihi*
White Ibis	*Eudocimus albus*
Roseate Spoonbill	*Ajaia ajaja*
Whistling Swan	*Olor columbianus*
Canada Goose	*Branta canadensis*
Brant	*Branta bernicla*
White-fronted Goose	*Anser albifrons*
Snow Goose	*Chen caerulescens*
Ross' Goose	*Chen rossii*
Black-bellied Whistling Duck	*Dendrocygna autumnalis*
Fulvous Whistling Duck	*Dendrocygna bicolor*
Mallard	*Anas platyrhynchos*
Gadwall	*Anas strepera*
Northern Pintail	*Anas acuta*
Green-winged Teal	*Anas crecca*

Baikal Teal	Anas formosa
Blue-winged Teal	Anas discors
Cinnamon Teal	Anas cyanoptera
European Wigeon	Anas penelope
American Wigeon	Anas americana
Northern Shoveler	Anas clypeata
Wood Duck	Aix sponsa
Redhead	Aythya americana
Ring-necked Duck	Aythya collaris
Canvasback	Aythya valisineria
Greater Scaup	Aythya marila
Lesser Scaup	Aythya affinis
Common Goldeneye	Bucephala clangula
Barrow's Goldeneye	Bucephala islandica
Bufflehead	Bucephala albeola
Oldsquaw	Clangula hyemalis
White-winged Scoter	Melanitta deglandi
Surf Scoter	Melanitta perspicillata
Black Scoter	Melanitta nigra
Ruddy Duck	Oxyura jamaicensis
Hooded Merganser	Lophodytes cucullatus
Common Merganser	Mergus merganser
Red-breasted Merganser	Mergus serrator
Turkey Vulture	Cathartes aura
California Condor	Gymnogyps californianus
White-tailed Kite	Elanus leucurus
Mississippi Kite	Ictinia mississippiensis
Goshawk	Accipiter gentilis
Sharp-shinned Hawk	Accipiter striatus
Cooper's Hawk	Accipiter cooperi
Red-tailed Hawk	Buteo jamaicensis
Red-shouldered Hawk	Buteo lineatus
Broad-winged Hawk	Buteo platypterus
Swainson's Hawk	Buteo swainsoni
Zone-tailed Hawk	Buteo albonotatus
Rough-legged Hawk	Buteo lagopus
Ferruginous Hawk	Buteo regalis
Harris' Hawk	Parabuteo unicinctus
Golden Eagle	Aquila chrysaetos
Bald Eagle	Haliaeetus leucocephalus
Marsh Hawk	Circus cyaneus
Osprey	Pandion haliaetus
Prairie Falcon	Falco mexicanus
Peregrine Falcon	Falco peregrinus
Merlin	Falco columbarius
American Kestrel	Falco sparverius
California Quail	Lophortyx californicus
Gambel's Quail	Lophortyx gambelii
Mountain Quail	Oreortyx pictus
Ring-necked Pheasant	Phasianus colchicus
Chukar	Alectoris chukar
Sandhill Crane	Grus canadensis
Clapper Rail	Rallus longirostris

Virginia Rail	Rallus limicola
Sora	Prozana carolina
Black Rail	Laterallus jamaicensis
Common Gallinule	Gallinula chloropus
American Coot	Fulica americana
American Oystercatcher	Haematopus palliatus
Semipalmated Plover	Charadrius semipalmatus
Snowy Plover	Charadrius alexandrinus
Killdeer	Charadrius vociferus
Mountain Plover	Charadrius montanus
American Golden Plover	Pluvialis dominica
Black-bellied Plover	Pluvialis squatarola
Black Turnstone	Arenaria melanocephala
Ruddy Turnstone	Arenaria interpres
Common Snipe	Capella gallinago
Long-billed Curlew	Numenius americanus
Whimbrel	Numenius phaeopus
Upland Sandpiper	Bartramia longicauda
Spotted Sandpiper	Actitis macularia
Wandering Tattler	Heteroscelus incanus
Willet	Catoptrophorus semipalmatus
Solitary Sandpiper	Tringa solitaria
Greater Yellowlegs	Tringa melanoleucus
Lesser Yellowlegs	Tringa flavipes
Red Knot	Calidris canutus
Pectoral Sandpiper	Calidris melanotos
White-rumped Sandpiper	Calidris fuscicollis
Baird's Sandpiper	Calidris bairdii
Least Sandpiper	Calidris minutilla
Rufous-necked Sandpiper	Calidris ruficollis
Curlew Sandpiper	Calidris ferruginea
Dunlin	Calidris alpina
Semipalmated Sandpiper	Calidris pusillus
Western Sandpiper	Calidris mauri
Sanderling	Calidris alba
Short-billed Dowitcher	Limnodromus griseus
Long-billed Dowitcher	Limnodromus scolopaceus
Stilt Sandpiper	Micropalama himantopus
Buff-breasted Sandpiper	Tryngites subruficollis
Marbled Godwit	Limosa fedoa
American Avocet	Recurvirostra americana
Black-necked Stilt	Himantopus mexicanus
Red Phalarope	Phalaropus fulicarius
Wilson's Phalarope	Steganopus tricolor
Northern Phalarope	Lobipes lobatus
Pomarine Jaeger	Stercorarius pomarinus
Parasitic Jaeger	Stercorarius parasiticus
Long-tailed Jaeger	Stercorarius longicaudus
Glaucous Gull	Larus hyperboreus
Glaucous-winged Gull	Larus glaucescens
Western Gull	Larus occidentalis
Herring Gull	Larus argentatus
Thayer's Gull	Larus thayeri

California Gull	*Larus californicus*
Ring-billed Gull	*Larus delawarensis*
Mew Gull	*Larus canus*
Laughing Gull	*Larus atricilla*
Franklin's Gull	*Larus pipixcan*
Bonaparte's Gull	*Larus philadelphia*
Little Gull	*Larus minutus*
Heermann's Gull	*Larus heermanni*
Black-legged Kittiwake	*Rissa tridactyla*
Sabine's Gull	*Xema sabini*
Gull-billed Tern	*Gelochelidon nilotica*
Forester's Tern	*Sterna forsteri*
Common Tern	*Sterna hirundo*
Arctic Tern	*Sterna paradisaea*
Least Tern	*Sterna albifrons*
Caspian Tern	*Sterna caspia*
Black Tern	*Chlidonias niger*
Black Skimmer	*Rynchops nigra*
Band-tailed Pigeon	*Columba fasciata*
Rock Dove	*Columba livia*
White-winged Dove	*Zenaida asiatica*
Mourning Dove	*Zenaida macroura*
Spotted Dove	*Streptopelia chinensis*
Ground Dove	*Columbina passerina*
Inca Dove	*Scardafella inca*
Yellow-billed Cuckoo	*Coccyzus americanus*
Roadrunner	*Geococcyx californianus*
Barn Owl	*Tyto alba*
Screech Owl	*Otus asio*
Flammulated Owl	*Otus flammeolus*
Great Horned Owl	*Bubo virginianus*
Pygmy Owl	*Glaucidium gnoma*
Elf Owl	*Micrathene whitneyi*
Burrowing Owl	*Athene cunicularia*
Spotted Owl	*Strix occidentalis*
Long-eared Owl	*Asio otus*
Short-eared Owl	*Asio flammeus*
Saw-whet Owl	*Aegolius acadicus*
Whip-poor-will	*Caprimulgus vociferus*
Poor-will	*Phalaenoptilus nuttallii*
Common Nighthawk	*Chordeiles minor*
Lesser Nighthawk	*Chordeiles acutipennis*
Black Swift	*Cypseloides niger*
Chimney Swift	*Chaetura pelagica*
Vaux's Swift	*Chaetura vauxi*
White-throated Swift	*Aeronautes saxatalis*
Black-chinned Hummingbird	*Archilochus alexandri*
Costa's Hummingbird	*Calypte costae*
Anna's Hummingbird	*Calypte anna*
Broad-tailed Hummingbird	*Selasphorus platycercus*
Rufous Hummingbird	*Selasphorus rufus*
Allen's Hummingbird	*Selasphorus sasin*
Calliope Hummingbird	*Stellula calliope*

Broad-billed Hummingbird	*Cynanthus latirostris*
Belted Kingfisher	*Megaceryle alcyon*
Common Flicker	*Colaptes auratus*
Gila Woodpecker	*Melanerpes uropygialis*
Red-headed Woodpecker	*Melanerpes erythrocephalus*
Acorn Woodpecker	*Melanerpes formicivorus*
Lewis' Woodpecker	*Melanerpes lewis*
Yellow-bellied Sapsucker	*Sphyrapicus varius*
Williamson's Sapsucker	*Sphyrapicus thryoideus*
Hairy Woodpecker	*Picoides villosus*
Downy Woodpecker	*Picoides pubescens*
Nuttall's Woodpecker	*Picoides nuttalli*
Ladder-backed Woodpecker	*Picoides scalaris*
Eastern Kingbird	*Tyrannus tyrannus*
Tropical Kingbird	*Tyrannus melancholicus*
Western Kingbird	*Tyrannus verticalis*
Cassin's Kingbird	*Tyrannus vociferans*
Scissor-tailed Flycatcher	*Muscivora forficata*
Wied's crested Flycatcher	*Myiarchus tyrannulus*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Olivaceous Flycatcher	*Myiarchus tuberculifer*
Eastern Phoebe	*Sayornis phoebe*
Black Phoebe	*Sayornis nigricans*
Say's Phoebe	*Sayornis saya*
Willow Flycatcher	*Empidonax traillii*
Least Flycatcher	*Empidonax minimus*
Hammond's Flycatcher	*Empidonax hammondii*
Dusky Flycatcher	*Empidonax oberholseri*
Gray Flycatcher	*Empidonax wrightii*
Western Flycatcher	*Empidonax difficilis*
Coue's Flycatcher	*Contopus pertinax*
Western Wood Pewee	*Contopus sordidulus*
Olive-sided Flycatcher	*Nuttallornis borealis*
Vermilion Flycatcher	*Pyrocephalus rubinus*
Horned Lark	*Eremophila alpestris*
Violet-green Swallow	*Tachycineta thalassina*
Tree Swallow	*Iridoprocne bicolor*
Bank Swallow	*Riparia riparia*
Rough-winged Swallow	*Stelgidopteryx ruficollis*
Barn Swallow	*Hirundo rustica*
Cliff Swallow	*Petrochelidon pyrrhonota*
Purple Martin	*Progne subis*
Blue Jay	*Cyanocitta cristata*
Steller's Jay	*Cyanocitta stelleri*
Scrub Jay	*Aphelocoma coerulescens*
Black-billed Magpie	*Pica pica*
Common Raven	*Corvus corax*
Common Crow	*Corvus brochyrhynchos*
Pinyon Jay	*Gymnorhinus cyanocephalus*
Clark's Nutcracker	*Nucifraga columbiana*
Mountain Chickadee	*Parus gambeli*
Plain Titmouse	*Parus inornatus*
Verdin	*Auriparus flaviceps*

Bushtit	*Psaltriparus minimus*
White-breasted Nuthatch	*Sitta carolinensis*
Red-breasted Nuthatch	*Sitta canadensis*
Pygmy Nuthatch	*Sitta pygmea*
Brown Creeper	*Certhia familiaris*
Dipper	*Cinclus mexicanus*
House Wren	*Troglodytes aedon*
Winter Wren	*Troglodytes troglodytes*
Bewick's Wren	*Thryomanes bewickii*
Cactus Wren	*Campylorhynchus brunneicapillus*
Long-billed Marsh Wren	*Cistothorus palustris*
Canyon Wren	*Catherpes mexicanus*
Rock Wren	*Salpinctes obsoletus*
Mockingbird	*Mimus polyglottos*
Gray Catbird	*Dumetella carolinensis*
Brown Thrasher	*Toxostoma rufum*
Bendire's Thrasher	*Toxostoma bendirei*
Curve-billed Thrasher	*Toxostoma curvirostre*
California Thrasher	*Toxostoma redivivum*
Le Conte's Thrasher	*Toxostoma lecontei*
Crissal Thrasher	*Toxostoma dorsale*
Sage Thrasher	*Oreoscoptes montanus*
American Robin	*Turdus migratorius*
Varied Thrush	*Ixoreus naevius*
Hermit Thrush	*Catharus guttatus*
Swainson's Thrush	*Catharus ustulatus*
Veery	*Catharus fuscescens*
Western Bluebird	*Sialia mexicana*
Mountain Bluebird	*Sialia currucoides*
Townsend's Solitaire	*Myadestes townsendi*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Black-tailed Gnatcatcher	*Polioptila melanura*
Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Regulus calendula*
Water Pipit	*Anthus spinoletta*
Bohemian Waxwing	*Bombycilla garrulus*
Cedar Waxwing	*Bombycilla cedrorum*
Phainopepla	*Phainopepla nitens*
Northern Shrike	*Lanius excubitor*
Loggerhead Shrike	*Lanius ludovicianus*
Starling	*Sturnus vulgaris*
Hutton's Vireo	*Vireo huttoni*
Bell's Vireo	*Vireo bellii*
Gray Vireo	*Vireo vicinior*
Yellow-throated Vireo	*Vireo flavifrons*
Solitary Vireo	*Vireo solitarius*
Philadelphia Vireo	*Vireo philadelphicus*
Warbling Vireo	*Vireo gilvus*
Black-and-white Warbler	*Mniotilta varia*
Prothonotary Warbler	*Protonotaria citrea*
Worm-eating Warbler	*Helmitheros vermivorus*
Golden-winged Warbler	*Vermivora chrysoptera*
Blue-winged Warbler	*Vermivora pinus*

Tennessee Warbler	Vermivora peregrina
Orange-crowned Warbler	Vermivora celata
Nashville Warbler	Vermivora ruficapilla
Virginia's Warbler	Vermivora virginiae
Lucy's Warbler	Vermivora luciae
Northern Parula	Parula americana
Yellow Warbler	Dendroica petechia
Magnolia Warbler	Dendroica magnolia
Cape May Warbler	Dendroica tigrina
Black-throated Blue Warbler	Dendroica caerulescens
Yellow-rumped Warbler	Dendroica coronata
Black-throated Gray Warbler	Dendroica nigrescens
Townsend's Warbler	Dendroica townsendi
Black-throated Green Warbler	Dendroica virens
Hermit Warbler	Dendroica occidentalis
Cerulean Warbler	Dendroica cerulea
Blackburnian Warbler	Dendroica fusca
Yellow-throated Warbler	Dendroica dominica
Grace's Warbler	Dendroica graciae
Chestnut-sided Warbler	Dendroica pensylvanica
Bay-breasted Warbler	Dendroica castanea
Blackpoll Warbler	Dendroica striata
Palm Warbler	Dendroica palmarum
Ovenbird	Seiurus aurocapillus
Northern Waterthrush	Seiurus noveboracensis
MacGillivray's Warbler	Oporornis tolmiei
Common Yellowthroat	Geothlypis trichas
Yellow-breasted Chat	Icteria virens
Red-faced Warbler	Cardellina rubrifrons
Hooded Warbler	Wilsonia citrina
Wilson's Warbler	Wilsonia pusilla
Canada Warbler	Wilsonia canadensis
American Redstart	Setophaga ruticilla
Painted Redstart	Myioborus pictus
House Sparrow	Passer domesticus
Western Meadowlark	Sturnella neglecta
Yellow-headed Blackbird	Xanthocephalus xanthocephalus
Red-winged Blackbird	Agelaius phoenicuns
Tricolored Blackbird	Agelaius tricolor
Orchard Oriole	Icterius spurius
Hooded Oriole	Icterus cucullatus
Streak-backed Oriole	Icterus pustulatus
Scott's Oriole	Icterus parisorum
Northern Oriole	Icterus galbula
Rusty Blackbird	Euphagus carolinus
Brewer's Blackbird	Euphagus cyanocephalus
Great-tailed Grackle	Quiscalus mexicanus
Brown-headed Cowbird	Molothrus ater
Bronzed Cowbird	Molothrus aeneus
Western Tanager	Piranga ludoviciana
Scarlet Tanager	Piranga olivacea
Hepatic Tanager	Piranga flava
Summer Tanager	Piranga rubra

Cardinal	*Cardinalis cardinalis*
Pyrrhuloxia	*Cardinalis sinuatus*
Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Blue Grosbeak	*Guiraca caerulea*
Indigo Bunting	*Passerina cyanea*
Lazuli Bunting	*Passerina amoena*
Varied Bunting	*Passerina versicolor*
Painted Bunting	*Passerina ciris*
Dickcissel	*Spiza americana*
Evening Grosbeak	*Hesperiphona vespertina*
Purple Finch	*Carpodacus purpureus*
Cassin's Finch	*Carpodacus cassinii*
House Finch	*Carpodacus mexicanus*
Gray-crowned Rosy Finch	*Leucosticte tephrocotis*
Black Rosy Finch	*Leucosticte atrata*
Pine Siskin	*Carduelis pinus*
American Goldfinch	*Carduelis tristis*
Lesser Goldfinch	*Carduelis psaltria*
Lawrence's Goldfinch	*Carduelis lawrencei*
Red Crossbill	*Loxia curvirostra*
Green-tailed Towhee	*Pipilo chlorurus*
Rufous-sided Towhee	*Pipilo erythrophthalmus*
Brown Towhee	*Pipilo fuscus*
Abert's Towhee	*Pipilo aberti*
Lark Bunting	*Calamospiza melanocorys*
Savannah Sparrow	*Passerculus sandwichensis*
Grasshopper Sparrow	*Ammodramus savannarum*
Le Conte's Sparrow	*Ammospiza leconteii*
Sharp-tailed Sparrow	*Ammospiza caudacuta*
Vesper Sparrow	*Pooecetes gramineus*
Lark Sparrow	*Chondestes grammacus*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Cassin's Sparrow	*Aimophila cassinii*
Black-throated Sparrow	*Amphispiza bilineata*
Sage Sparrow	*Amphispiza belli*
Dark-eyed Junco	*Junco hyemalis*
Gray-headed Junco	*Junco caniceps*
Tree Sparrow	*Spizella arborea*
Chipping Sparrow	*Spizella passerina*
Clay-colored Sparrow	*Spizella pallida*
Brewer's Sparrow	*Spizella breweri*
Black-chinned Sparrow	*Spizella atrogularis*
Harris' Sparrow	*Zonotrichia querula*
White-crowned Sparrow	*Zonotrichia leucophrys*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
White-throated Sparrow	*Zonotrichia albicollis*
Fox Sparrow	*Passerella iliaca*
Lincoln's Sparrow	*Melospiza lincolnii*
Swamp Sparrow	*Melospiza georgiana*
Song Sparrow	*Melospiza melodia*
McCown's Longspur	*Calcarius mccownii*
Lapland Longspur	*Calcarius lapponicus*
Chestnut-collared Longspur	*Calcarius ornatus*
Snow Bunting	*Plectrophenax nivalis*

APPENDIX 3c

Amphibians Known to be Found within or in Close Proximity to the CDCA

Common Name	Scientific Name
Desert Slender Salamander	*Batrachoseps aridis*
Garden Slender Salamander	*Batrachoseps major*
Tehachapi Slender Salamander	*Batrachoseps stebbinsi*
Inyo Mountains Salamander	*Batrachoseps campi*
Couch's Spadefoot	*Scaphiopus couchi*
Colorado River Toad	*Bufo alvarius*
Western Toad	*Bufo boreas*
Black Toad	*Bufo exsul*
Woodhouse's Toad	*Bufo woodhousei*
Southwestern Toad	*Bufo microscaphus*
Red-spotted Toad	*Bufo punctatus*
Great Plains Toad	*Bufo cognatus*
California Treefrog	*Hyla cadaverina*
Pacific Treefrog	*Hyla regilla*
San Sebastian Leopard Frog	*Rana cf pipiens*
Bullfrog	*Rana catesbeiana*

APPENDIX 3d

Reptiles Known to Occur in the CDCA

Common Name	Scientific Name
Western Pond Turtle	Clemmys marmorata
Desert Tortoise	Gopherus agassizi
Spiny Softshell	Trionyx spiniferus
Banded Gecko	Coleonyx variegatus
Magic Gecko	Anarbylus switaki
Leaf-toed Gecko	Phyllodactylus xanti
Desert Iguana	Dipsosaurus dorsalis
Chuckwalla	Sauromalus obesus
Zebra-tailed Lizard	Callisaurus draconoides
Colorado Desert Fringe-toed Lizard	Uma notata
Coachella Valley Fringe-toed Lizard	Uma inornata
Mojave Fringe-toed Lizard	Uma scoparia
Lower Colorado Desert Collared Lizard	Crotaphytus insularis
Desert Collared Lizard	Crotaphytus bicinctores
Leopard Lizard	Gambelia wislizenii
Desert Spiny Lizard	Sceloporus magister
Granite Spiny Lizard	Sceloporus orcutti
Western Fence Lizard	Sceloporus occidentalis
Sagebrush Lizard	Sceloporus graciosus
Side-blotched Lizard	Uta stansburiana
Long-tailed Brush Lizard	Urosaurus graciosus
Tree Lizard	Urosaurus ornatus
Small-scaled Lizard	Urosaurus microscutatus
Banded Rock Lizard	Petrosaurus mearnsi
Coast Horned Lizard	Phrynosoma coronatum
Desert Horned Lizard	Phrynosoma platyrhinos
Flat-tailed Horned Lizard	Phrynosoma mcalli
Granite Night Lizard	Xantusia henshawi
Desert Night Lizard	Xantusia vigilis
Western Skink	Eumeces skiltonianus
Gilbert's Skink	Eumeces gilberti
Orange-throated Whiptail	Cnemidophorus hyperythrus
Western Whiptail	Cnemidophorus tigris
Southern Alligator Lizard	Gerrhonotus multicarinatus
Panamint Alligator Lizard	Gerrhonotus panamintinus
California Legless Lizard	Anniella pulchra
Gila Monster	Heloderma suspectum
Western Blind Snake	Leptotyphlops humilis
Rosy Boa	Lichanura trivirgata
Ringneck Snake	Diadophis punctatus
Spotted Leaf-nosed Snake	Phyllorhynchus decurtatus
Racer	Coluber constrictor
Coachwhip	Masticophis flagellum
Striped Racer	Masticophis lateralis
Striped Whipsnake	Masticophis taeniatus
Western Patch-nosed Snake	Salvadora hexalepis
Glossy Snake	Arizona elegans

Gopher Snake	*Pituophis melanoleucus*
Common Kingsnake	*Lampropeltis getulus*
California Mountain Kingsnake	*Lampropeltis zonata*
Long-nosed Snake	*Rhinocheilus lecontei*
Western Terrestrial Garter Snake	*Thamnophis elegans*
Checkered Garter Snake	*Thamnophis marcianus*
Western Ground Snake	*Sonora semiannulata*
Western Shovel-nosed Snake	*Chionactis occipitalis*
Wesetern Black-headed Snake	*Tantilla planiceps*
Lyre Snake	*Trimorphodon biscutatus*
Night Snake	*Hypsiglena torquata*
Western Diamondback Rattlesnake	*Crotalus atrox*
Red Diamond Rattlesnake	*Crotalus ruber*
Speckled Rattlesnake	*Crotalus mitchelli*
Sidewinder	*Crotalus cerastes*
Western Rattlesnake	*Crotalus viridis*
Mojave Rattlesnake	*Crotalus scutulatus*

APPENDIX 3e

Mammals Known to be Existing Within or in Close Proximity to the CDCA

Common Name	Scientific Name
Opossum	Didelphis virginiana
Ornate Shrew	Sorex ornatus
Inyo Shrew	Sorex tenellus
Merriam's Shrew	Sorex merriami
Desert Shrew	Notiosorex crawfordi
Broad-footed Mole	Scapanus latimanus
California Leaf-nosed Bat	Macrotus californicus
Little Brown Myotis	Myotis lucifugus
Yuma Myotis	Myotis yumanensis
Cave Myotis	Myotis velifer
Arizona Myotis	Myotis occultus
Long-eared Myotis	Myotis evotis
Fringed Myotis	Myotis thysanodes
Long-legged Myotis	Myotis volans
California Myotis	Myotis californicus
Small-footed Myotis	Myotis leibii
Silver-haired Bat	Lasionycteris noctivagens
Western Pipistrelle	Pipistrellus hesperus
Big Brown Bat	Eptesicus fuscus
Red Bat	Lasiurus borealis
Hoary Bat	Lasiurus cinereus
Southern Yellow Bat	Lasiurus ega
Spotted Bat	Euderma maculatum
Townsend's Big-eared Bat	Plecotus townsendii
Pallid Bat	Antrozous pallidus
Brazilian Free-tailed Bat	Tadarida brasiliensis
Pocketed Free-tailed Bat	Tadarida femorosacca
Big Free-tailed Bat	Tadarida molossa
Western Mastiff Bat	Eumops perotis
Brush Rabbit	Sylvilagus bachmani
Nuttall's Cottontail	Sylvilagus nuttallii
Desert Cottontail	Sylvilagus audubonii
Black-tailed Jack Rabbit	Lepus californicus
Merriam's Chipmunk	Eutamias merriami
Panamint Chipmunk	Eutamias panamintinus
Uinta Chipmunk	Eutamias umbrinus
White-tailed Antelope Squirrel	Ammospermophilus leucurus
Rock Squirrel	Spermophilus variegatus
California Ground Squirrel	Spermophilus beecheyi
Mohave Ground Squirrel	Spermophilus mohavensis
Round-tailed Ground Squirrel	Spermophilus tereticaudus
Golden-mantled Ground Squirrel	Spermophilus lateralis
Western Gray Squirrel	Sciurus griseus
Botta's Pocket Gopher	Thomomys bottae
Little Pocket Mouse	Perognathus longimembris
San Joaquin Pocket Mouse	Perognathus inornatus

Great Basin Pocket Mouse	Perognathus parvus
Yellow-eared Pocket Mouse	Perognathus xanthonotus
Long-tailed Pocket Mouse	Perognathus formosus
Bailey's Pocket Mouse	Perognathus baileyi
Desert Pocket Mouse	Perognathus penicillatus
San Diego Pocket Mouse	Perognathus fallax
California Pocket Mouse	Perognathus californicus
Spiny Pocket Mouse	Perognathus spinatus
Pale Kangaroo Mouse	Microdipodops pallidus
Ord's Kangaroo Rat	Dipodomys ordii
Chisel-toothed Kangaroo Rat	Dipodomys microps
Panamint Kangaroo Rat	Dipodomys panamintinus
Agile Kangaroo Rat	Dipodomys agilis
Desert Kangaroo Rat	Dipodomys deserti
Merriam's Kangaroo Rat	Dipodomys merriami
Western Harvest Mouse	Reithrodontomys megalotis
Canyon Mouse	Peromyscus crinitus
California Mouse	Peromyscus californicus
Cactus Mouse	Peromyscus eremicus
Deer Mouse	Peromyscus maniculatus
Brush Mouse	Peromyscus boylii
Pinon Mouse	Peromyscus truei
Northern Grasshopper Mouse	Onychomys leucogaster
Southern Grasshopper Mouse	Onychomys torridus
Hispid Cotton Rat	Sigmodon hispidus
White-throated Woodrat	Neotoma albigula
Desert Woodrat	Neotoma lepida
Dusky-footed Woodrat	Neotoma fuscipes
Bushy-tailed Woodrat	Neotoma cinerea
California Vole	Microtus californicus
Sagebrush vole	Lagurus curtatus
Muskrat	Ondatra zibethicus
House Mouse	Mus musculus
Porcupine	Erethizon dorsatum
Coyote	Canis latrans
Kit Fox	Vulpes macrotis
Gray Fox	Urocyon cinereoargenteus
Black Bear	Ursus americanus
Ringtail	Bassariscus astutus
Raccoon	Procyon lotor
Long-tailed Weasel	Mustela frenata
Badger	Taxidea taxus
Western Spotted Skunk	Spilogale gracilis
Striped Skunk	Mephitis mephitis
Mountain Lion	Felis concolor
Bobcat	Felis rufus
Mule Deer	Odocoileus hemionus
Bighorn Sheep	Ovis canadensis

APPENDIX 3f

Significant Species of the CDCA

Invertebrates - Molluscs (Family - Helminthoglyptidae)

- *Helminthoglypta graniticola*
- *Helminthoglypta greggi*
- *Helminthoglypta micrometalleoides*
- *Helminthoglypta mohaveana*
- *Micrarionta aquaelbae*
- *Micrarionta brunnea*
- *Micrarionta harperi*
- *Micrarionta immaculata*
- *Micrarionta indioensis cathedralis*
- *Micrarionta melanopylon*
- *Micrarionta millepalmarum*
- *Micrarionta morongoana*
- *Micrarionta orocopia*
- *Micrarionta rowelli*
  - *Micrarionta rowelli acus*
  - *Micrarionta rowelli amboiana*
  - *Micrarionta rowelli bakerensis*
  - *Micrarionta rowelli chocolata*
  - *Micrarionta rowelli chuckwallana*
  - *Micrarionta rowelli granitensis*
  - *Micrarionta rowelli mccoiana*
- *Mohavelix micrometalleus*
- *Sonorelix avawatzica*
- *Sonorelix baileyi*
- *Sonorelix borregoensis*
  - *Sonorelix borregoensis borregoensis*
  - *Sonorelix borregoensis carrizoensis*
  - *Sonorelix borregoensis ora*
- *Sonorelix rixfordi*
- *Fontelicella micrococcus*
- *Fontelicella* n. sp.

Invertebrates - Cladocera (Family: Moinidae)

- *Moina brachycephela*

Invertebrates - Insects (order - Lepidoptera) Butterflies/Moths

- Ethmiidae (Ethmiid Moths):
  - *Ethmia* n.sp.
- Tortricidae (Tortricid Moths):
  - *Suleima* n.sp.
- Scythridae (Scythrid Moths):
  - *Areniscythris* n.sp.
  - N.gen., n.sp.

Lepidoptera (cont.)

- Noctuidae (Noctuid Moths):
  - *Protogygia polingi*
  - *Copablepharon serrata*
- Pyralidae (Pyralid Moths):
  - *Loxocrambus mohaviellus*
- Andrenidae (Andrenid Bees):
  - *Andrena boronensis*
  - *Andrena deserticola*
  - *Andrena mojavensis*
  - *Nomadopsis foleyi*
  - *Nomadopsis larreae*
  - *Nomadopsis timberlakei*
- Megachilida (Leaf-cutting Bees):
  - *Anthocopa panamintensis*
  - *Ashmeadiella stenognatha*
  - *Dianthidium desertorum*
  - *Heteranthidium bequaerti*
  - *Proteriades bidenticauda*
  - *Proteriades hamulicornis*
- Colletidae (Masterer Bees):
  - *Colletes stepheni*
- Masaridae:
  - *Pseudomasaris micheneri*
- Sphecidae (Sphecid Wasps):
  - *Bembix* n.sp.
- Vespidae (Vespid Wasps):
  - *Polistes major palmarum*
- Formicidae (ants):
  - *Hypoponera opaciceps*
  - *Hypoponera opacior*
  - *Pogonomyrmex anzensis*
  - *Pogonomyrmex desertorum*
  - *Pogonomyrmex tenuispinus*
  - *Pheidole psammophila*
  - *Acromyrmex versicolor*
  - *Myrmecocystus* n.sp.
  - *Solenopsis* n.sp.
  - *Leptothorax* sp. A

Invertebrates - Insects (order - Hemiptera) True Bugs

- Corixidae (Water Boatmen):
  - *Trichocorixa verticalis saltoni*

Invertebrates - Insects (order-Diptera) Flies

- Asilidae (Robber Flies):
  - *Efferia*?
  - *Efferia tolandi*
  - *Efferia yermo*

Asilidae (Cont.)

Proctacanthella tolandi
Promachus?
Machimus species nr. *callidus*
Cophura dammersi
Cophura getzendaneri
Cophura powersi
Cophura rozeni
Cophura timberlakei
Cophura tolandi
Cophura vandykei
Diogmites contortus
Lestomyia Sp. 2 - (New)
Omniablautus nigripes
Omniablautus tolandi
Omniablautus n. sp.
Cerotainiops mcclayi
Laphystia howlandi
Laphystia martini
Ablautus basini
Ablautus coachellus
Ablautus linsleyi
Backomyia anomalus
Backomyia n.sp.
Eucyrtopogon n.sp.
Itolia timberlakei
Metapogon amargosae
Metapogon tricellus
Nannocyrtopogon deserti
Nannocyrtopogon inyoi
Nannocyrtopogon neoculatus
Nannocyrtopogon oculatus
Nannocyrtopogon timberlakei
Nannocyrtopogon tolandi
Nannocyrtopogon n.sp.
Ospriocerus brevis
Sintoria mojavae
Stenopogon adelantae
Stenopogon mojavae

Invertebrates - Insects (order - Coleoptera) Beetles

Histeridae (Hister Beetles):
    Philothris sp.
Scydmaenidae (Antlike stone Beetles):
    Eremosaprinus n.sp.
    Papusus sp.
Dytiscidae (Predaceous Diving Beetles):
    Deronectes coelamboides
Hydrophilidae (Water Scavenger Beetles):
    Berosus cf *ingeminatus*

- Curculionidae (Weevils):
    - *Trigonoscuta rothi*
    - *Trigonoscuta* n.sp.
    - *Trigonoscuta brunotesselatus*
    - *Trigonoscuta kelsoensis kelsoensis*
    - *Trigonoscuta* sp.
    - *Miloderes nelsoni*
    - *Miloderes* n.sp.#1
    - *Miloderes* n.sp.#2
    - *Minyomerus* n.sp.
    - *Eucilinus aridus tinkhami*
    - Dermestidae (Dermestids):
    - *Novelsis* sp.
- Pedilidae (Pedilid Beetles):
    - N. gen., n.sp.
- Tenebrionidae (Darkling Beetles):
    - *Areoschizus* sp.
    - *Eusattus fortineri*
    - *Batuliodes* n.sp.
- Chrysomelidae (Leaf Beetles):
    - N. gen., n.sp.
- Cryptophagidae (Silken Fungus Beetles):
    - *Cryptophagus* n.sp.
- Elateridae (Click Beetles):
    - *Cardiophorus* n.sp.
    - *Horistonotus* n.sp.
- Scarabaeidae (Scarab Beetles):
    - *Anomala carlsoni*
    - *Anomala hardyorum*
    - *Cyclocephala wandae*
    - *Diplotaxis corbula*
    - *Glaresis arenata*

APPENDIX 4

Candidate ACECs Not Recommended

Wildlife

Pisgah Crater
West Mojave Salt Bush Comm
Chemehuevi Wash
Granite Mountains
Ford Dry Lake
West Panamint
Mesquite Thicket
Indian Wash
New York Mountains
Barefoot Gecko Habitat
Deep Springs Black Toad
Deep Springs Shadscale
East Facing Sierras
Cima Dome Joshua Tree
Desert Slender Salamander
Malpitas Wash
Chicago Valley Mesquite
Upper Amargosa River
McCoy Wash
Big Morongo Canyon
East Cronese Lake
Smugglers Cave
Santa Rosa Mountains
Robbers Roost
Grapevine Canyon
Vidal Wash
Pinto Wash

Cultural Values

1000 Palms Oasis
Deep Canyon
Jawbone Canyon
Bristol Lake
Rhodes Hill
South Owens Lake
Camp Irwin Boundary
Kramer Hills
Valley Wells
Lone Tree Canyon
Crucero Area
Amargosa Rings
Cuddeback Lake
Cerro Gordo
Willow Creek
North Ryan
Indian Pass

Panamint Dunes
Lake Hill
Mule Canyon
Southeastern Cadiz Lake
West Well
Holloran Wash
White Mountain City
Old Wells
Last Chance Canyon
Christmas Canyon
Spangler Hills
Superior Lake
McDonald Well
Portuguese Bench
Warm Sulphur Springs
Crater
Rose Spring
Silner Mountain
Denning Spring
Baxter Ranch
Sheep Creek Spring
Zinc Hill
Paymaster
Rodman Mountains
North Clapp Spring
The Tanks
Sidewinder Well
Emigrant Road
Volcanic Cone
Superstition Mountains
Arica Mountains
Palen Lake
Mesquite Lake
East Big Maria Mountains
Blind Hills
Mojave Road
Lake Cahuilla
Mule Mountain Plank Road
Piute Wash
Bristol Lake
Dale Lake
East Mesa
South McCoy Mountains
Ford Dry Lake

Recreation

Butterfield Route
Providence Mountains
Mopah Springs
Woods Mountain
Golden Valley
New York Mountain

Mid Hills
Pipkin Crater

Geology

Dinosaur Track Way
Marble Mountain Fossils
Providence Mt. Fossils

Vegetation

Big Sandy Springs
Last Chance Mts.
Cerro Gordo Peak
Greenwater Range
Death Valley Junction
Red Rock Canyon
Kramer Junction
Lane Mountains Daggett
Soggy Lake
East Ord Mts.
Cush~~a~~enberry Grade
Chuckwalla Valley
Mecca Hills
East Mesa
Sidebunder Well

Appendix 5a

Cultural Resource Program: Methodology

The process of cultural resource data collection, inventory, analysis and report preparation geared toward desert planning has been ongoing since 1969. Approaches and methods have altered over the years as the planning process has changed, according to the orientation of the various lead archaeologists, and in concert with theoretical and methodological advances in the concerned disciplines.

In 1969 BLM contracted with Archaeological Research, Inc. for a purposive survey of the California Desert. This brief inventory resulted in the surface collection of a number of artifacts from many sites, as well as collections from excavations in several sites. Little work ensued until 1973 when Margaret Weide completed a proposed methodology for inventorying the California Desert. This work provided the basic assumptions and objectives behind the subsequent field work.

The assumptions developed by Weide relate to an association between cultural and economic resources. These associations are expected to vary through time, between cultural groups, and with different levels of socio-economic organizations. An added assumption is that certain historic resources may be relatively randomly distributed. This is the result of the modernizing society overcoming or neutralizing the environmental constraints.

Also, it is assumed that there have been some social and ideological influences on human settlement and activities. With some exceptions, these assumptions seem justified within the context of the small sample.

The major objective of the prehistoric and historic field studies is the location of cultural resources through a systematic sampling program in such a manner that the cultural resource specialists would be able to confidently predict other archaeological (prehistoric-historic) locations. The degree of specificity of prediction and the measure of confidence vary by region. More will be said about this. Predictions are based on a correlation of archaeological sites with variables of water resource and biogeography. Actual site location and prediction of site occurrence serve to aid in the evaluation of individual sites and groupings of sites as to their relative significance and sensitivity. This process is done with an eye toward preservation and protection and an increased understanding of earlier desert peoples.

The cultural resource program is both regional and areal in perspective. It is regional in the sense that the environmental complexity and variation of the desert necessitate some control, best effected through a division into relatively homogeneous or natural subdivisions. And it is areal in the sense that there is a general measure of similarity between regions (i.e., desert conditions and a planning effort directed toward the whole).

Prior to, or in conjunction with the field surveys, regional cultural resource overviews were completed. In part these overviews provide for informed and well-directed field sampling. (It should be quite obvious that the immensity of the desert, the paucity of previous investigations and the time, labor and budgetary constraints necessitated a sampling approach.)

During this project seven regional cultural resource overviews were completed under contract. These overviews synthesize regional archaeological, ethnological, ethno-historical and historical data, discuss past and projected research, highlight significant cultural/environmental interrelationships, and identify research and management questions and needs. In some cases overviews provide only superficial coverage of important facets of the desert or do not give the necessary desert-wide perspective. In these cases special studies oriented towards certain cultural topics were deemed necessary as part of the planning process.

Completed studies include overviews of the Yuha Desert (Wilke et al., 1974), El Paso/Red Mountain desert region (Hall and Barker, 1975), East Mojave (King and Casebier, 1976), Southwest Great Basin (Norwood, Bull and Quinn, 1978), Western Mojave (Stickel and Weinman, 1979), Northeast Mojave (Warren, Warren and Knack, 1980), and Colorado Desert (Crabtree, Warren and Knack, 1980). Special reports include a study of California desert rock art (Eastvold, 1974), a study of historic trails and wagon roads (Warren and Roske, 1978), an analysis of historic faunal remains from Inyo County sites (Schulz, 1977), a compendium of early historic accounts of desert travellers and events (Casebier, 1978), "A History of Land Use in the California Desert" (Norris and Carrico, 1978), an overview of the history of mining in the California desert (Vredenburgh, Hartill and Shumway, 1979), an overview of early human occupation and activities in the California desert (Davis and Nichols, 1979), and an assessment of impacts to cultural resources (Lyneis and Weide, 1979).

Throughout the planning process DPS has developed a library and archives containing publications on desert anthropology, history, and environment, and other pertinent works. More importantly, various unpublished documents and reports relating to archaeological surveys, excavations, and studies of local history and prehistory are on file. A catalogue of the approximately 12,000 archaeological site records of the entire CDCA (with accompanying maps) is stored with DPS, and an extensive photographic collection is maintained. The information stored at DPS has been helpful in properly directing the fieldwork, in completing the overviews and certain of the other studies, and in undertaking the analysis and write-up of the cultural resource element of the plan. During the process many knowledgeable individuals, agencies, institutions and groups have been contacted for input to the planning process. In addition various presentations to professional and other groups have been made and input solicited.

The field sampling regions correspond rather well with the overview regions. However, some of these regions have been further subdivided into separate zones for better control in the sampling and because of administrative reasons. The actual inventories were undertaken by BLM contractors within the Northeast Mojave (Coombs, 1978), Western Mojave (Coombs, 1979), Central Mojave and Colorado deserts (Gallegos et al., 1979), and Mojave Basin region (Brooks et al., 1979). The remaining desert areas (Yuha, eastern Colorado, western Colorado, East Mojave, Southwest Great Basin, and El Paso/Red Mountain) were inventoried by the DPS cultural resource specialists. In the case of Anza-Borrego Desert State Park a cooperative survey was undertaken by park archaeologists. Formal fieldwork in all areas was carried out between the spring of 1974 and the winter of 1978-79.

In the first few years of the program the field methodology employed differed considerably from subsequent studies. The El Paso/Red Mountain, East Mojave, Saline Valley and, partly, the Yuha Desert regions were inventoried at approximately the 1-3% level. The square mile section was the investigative unit. Units were selected randomly by topographic quadrangle or through systematic placement within environmental zones believed relevant to the undertaking of differing prehistoric and/or historic activities. The archaeologists would locate themselves on the ground by utilizing bench marks, landmarks, compass bearings, etc. and then proceed within the unit in an approximately linear fashion up and back at 200 meter intervals, recording all prehistoric and historic remains over 35 years of age as well as pertinent environmental information (vegetation, landform, water resources, etc.). One hundred and twenty-eight square mile sections were surveyed in this manner. Supplemental opportunistic sampling complemented the fieldwork throughout the inventory period.

With a change in administrative policy outlook during 1976 and with positive and negative feedback from other sampling approaches, the methodology was altered for the remaining 75% or so of the desert. This new methodology included the use of transects 1/8th mile wide and one mile long oriented according to the cardinal directions . _ . Sampling varied by study region and investigator but generally included systematic or random stratified sampling in the first stage coupled with second and even third stage sampling directed at smaller blocks or zones. The subsequent stages were aimed at clarifying information gained in the first stage or filling data gaps.

During transect inventory two individuals swept in linear fashion up and back spaced at 50 meter intervals. This technique, applied regionally at the ½ to 2% level (1% overall desert-wide) allows greater precision of measurement and more on-the-ground observations. Twelve-hundred and six transects were inventoried during the project.

In total about 280 square miles were systematically inventoried using all approaches, and approximately another 50 square miles were inventoried intuitively or during transit to and from survey units.

During the fieldwork special forms were utilized (as alluded to previously) which detailed both the locational, environmental and cultural information for the sample unit as well as the equivalent information for each site. Special records for prehistoric and historic sites were developed. Photo documentation was also undertaken. Examples of the forms, site definitions and categories utilized are appended. A key to the environmental variables employed is on file with BLM, Riverside. For purposes of analysis, all sample unit and site record information obtained during DPS inventories was computerized on a Data General Eclipse System. Specific statistical routines were developed under contract with the Institute for American Research (formerly ARI) to help with the eventual data analysis. These routines include stepwise regression, analysis of covariance, Kendall's Tau, cross tabulation, regression/correlation, Spearman's r, analysis of variance, Fisher's exact test and Chi-square test. Computer programs also were developed to correlate up to three separate variables within the DPS sample of 2903 historic and prehistoric sites. These variables include locational, environmental and cultural information.

An added technique of analysis included the plotting of site and environmental information on mylar overlays. Utilizing a base map, this method allowed for qualitative evaluation of various correlations not derived in the more formalized statistical methods.

Following completion of the inventory effort, all data were assembled and organized and some were computerized and/or mapped. Various analyses (some preliminary) were completed. Subsequently, several meetings were held with Bureau and non-Bureau archaeologists and historians to discuss the development of criteria for mapping sensitive/significant cultural resources before plan alternatives and classes were formulated.

Field Inventory Result Summary

While a brief synthesis of the existing cultural resource environment was previously presented, a more detailed summary from a regional perspective is warranted within the context of this document.

In the El Paso Mountain area, the first planning unit to be surveyed (1974), an extremely rich archaeological zone was found, centered within the El Paso Mountains. Large open campsites occur along the mountain base as do extensive chalcedony quarries. Rockshelters, cremation shelters, petroglyphs, rock rings and milling stations are common. The Rand Mountains contain a well-documented mining area, in which the Yellow Aster mine is most famous.

In the adjoining Red Mountain Planning Unit of western San Bernardino County seasonal aboriginal occupation was inferred, from archaeological remains, to be focused around the Lava Mountains and Inscription Canyon. Included in the discoveries are village sites, rock art complexes, occupation rockshelters and others. As one progresses south onto the broad alluvial flats just north of Kramer, only small prehistoric stone workshops or cooking stations are found. The Trona Railroad and its construction camps, the Spangler Hills Mining District and the famous 20-Mule Team Road are important historical features.

The East Mojave represents an area where, relatively speaking, the most field input was accomplished (cf. Hanks and Binning, 1976). A tremendous array of prehistoric (87%) and historic (13%) sites were encountered. A majority of these sites are lithic scatters, the most frequent site type in the desert. However, this area of the desert has the highest proliferation of rock art sites, a tremendous array of mining camps, the Old Government Road with associated forts and redoubts, and numerous other complex sites. This is certainly an area with one of the highest site densities and diversity indices, although sites tend to be clustered subregionally.

Another area exhibiting a high site density is the Yuha Desert. Along with the Calico location this desert has been the scene of many archaeological discoveries of proposed Pleistocene ("Early Man") age. However, the vast majority of sites found relate to later prehistoric activities. Old shorelines of Lake Cahuilla, mesquite groves, springs and transitional vegetation communities of the mountains and valley desert edge were focal spots of habitation and subsistence activities. Statistical tests run indicate a tendency for habitation and special purpose sites to be associated with one another in this area, adding credibility to the settlement/subsistence models proposed in the overview and by other researchers. Collectively the tests seem to point toward the spring as a critical limiting factor with respect to prehistoric activity in much of the Yuha Desert. This is a bit surprising considering the known influence of Lake Cahuilla.

In neighboring Anza-Borrego Desert State Park, cooperative surveys have revealed site densities which on an average exceed 25 sites per square mile, primarily roasting pits and milling stations, but also other sites. This rich area extends north and south into public lands.

The basin and range planning units west of Death Valley represent an environmentally rich area where a number of major aboriginal settlements were located. The influence of the Sierra Nevada, Owens River, Owens Lake, and several major streams and springs can be seen in the archaeology. This is also a key area in the development of Great Basin and Mojave Desert cultural chronology as exemplified by the China Lake, Rose Spring and Stahl sites. A number of other major locations of a similar nature have yet to be professionally tested. Rock art reaches a developmental climax in the California Desert in parts of this region. The junction of fan/pediment and mountain slopes, and playas and fans seems to be a particularly significant aspect of regional archaeology. The Darwin Plateau, on the other hand, was found to be generally lacking in prehistoric sites, probably attributable to an absence of water sources. The influence of the pinyon-juniper environment on prehistoric activities is quite evident and there is an anazing association with historic sites as well, but for apparently other reasons (e.g., ore deposits). In fact some of the most famous mining communities in the desert occur in this area: Panamint City, Lookout, Cerro Gordo, Darwin and others.

In the northeastern Mojave Desert, generally east of Death Valley, various results have been presented by Coombs (1978) and only a few of his findings will be highlighted here. Mountains seem to be generally devoid of sites with the exception of the Clark Mountains where limestone belts yield numerous agave roasting pits, a result of *Agave utahensis* being confined to these belts. In part the low frequency overall and limited number of site types found in the mountains may be a result of site destruction by natural elements. Milling tools were strongly associated with both mesquite and yucca communities, an unsurprising correlation. Sites also tend to occur in areas with more vegetation cover, perhaps a biomass association relating to hunting and processing of foods. Possibly one of the most significant conclusions is that sites tend to occur either along the upper pediment or near the valley floor with few cultural remains in between. Part of this pattern relates to tool making activities and part to preservation factors.

During surveys within the Mojave Basin area by Brooks et al., (1978), a range of prehistoric and historic sites was encountered. Historic sites include mining, ranching, railroad and disposal remains, camps, and water development features. Mountain and valley locations are present. There is a predominance of lithic material sites (workshops) in the pediment/ arroyo zones and a low frequency in mountain/hill zones, relating to the availability of float for quarry activities and tool making of unknown times. A high prevalence of campsites in lake dune locations and right around the playas, as well as within the Mojave Sink attests to the importance of this area for subsistence/economic activities for much of the prehistoric period.

Within the western Mojave area, centered on Barstow/Victorville, Coombs (1979) has provided a detailed report of his surveys. The importance of the Mojave River to prehistoric activities cannot be stressed enough. Generally speaking the likelihood of finding sites tends to decline as the distance from the river decreases. Habitation sites (large and small) along the middle stretch of the Mojave River generally tend to occur at a more or less fixed distance from the river, perhaps between 0.6 and one mile. Also, special activity sites tend to cluster around habitation sites; as the latter increase in number, so do the former. This apparent pattern seems to have occurred over a long time span. In other valley systems, sites tend to predominate in the narrower basins. The influence of the Mojave River is still apparent, however. The so-called boundary mountains of the western Mojave (e.g., San Bernardino Mountains) also appear to stand out archaeologically in comparison to the other regional mountain ranges (i.e., in terms of number, diversity and complexity of sites).

Springs once again proved very important as site predictors. Sites (prehistoric and historic) of many types do cluster most densely immediately surrounding the springs, with site density declining with increasing distance from the spring. As Coombs notes (1979:84), "Clearly, springs have played a major role in the spatial patterning of human activity through many phases of the desert's occupation."

Westec Services, Inc. (Gallegos et al., 1979), under contract with BLM, completed a 0.5% inventory of a 2½ million acre block of the California Desert, an area of the north-central Colorado Desert generally (formerly) thought to be relatively poor in cultural remains. For large portions of the area this has proven to be a misconception. Major aboriginal trade and transportation trails (i.e., Coco-Maricopa Trail) along which habitation and rock art sites occur run east-west through the area. Portions of given mountain ranges were observed where raw materials (e.g., chert) were processed for tool making. Various environmental factors were identified, suggesting not only the presence but the preservation of sites on hills, pediments and older alluvial fans with desert pavement; this is in contrast to the lower frequency of sites on the newer, more active fans located farther from the mountain base, a recurring pattern. Water resource factors again are important determinants. The presence of apparent Early Human and later sites around dry lake beds is an important discovery, clarifying and extending to this area recognized patterns in the northern desert. The historical inventories present a picture of numerous small mining camps, transportation corridor elements and General Patton's World War II relics. The vehicle tracks and ordnance refuse from this famed general's activities provide evidence to the fragility of the desert landscape.

A forty mile wide stretch along the west side of the Colorado River contains some very significant archaeological areas, especially within the Chemehuevi/Whipple mountains and in the Picacho/Chocolate mountain area. The effect of the Colorado River on human activities has been and continues to be very strong, even at a distance of many miles. In this area spring locations are not strong predictors of site patterning for reasons stated above. Looking more specifically at individual site types, the greatest concentration of intaglios in North America occurs here as well as well-preserved trail systems, major rock art sites, and habitation caves. To many people's surprise the earliest gold mines in California--dating to the late 1700's-- are found in this region. And the later Bradshaw Trail is a noteworthy early historic route.

The final area of discussion, encompassing the Santa Rosa and Orocopia mountains, includes a continuation of the rich Anza-Borrego zone discussed earlier. Survey resulted in similar conclusions discussed previously, e.g., the importance of springs and the significance (even at a distance of some miles) of ancient Lake Cahuilla. The Santa Rosa Mountains seem to have been especially productive as reflected in a very high site density and a number of major campsites, including rare aboriginal stone ruins. In contrast the Orocopia Mountains apparently contain few prehistoric and historic sites with the exception of a few mines and the remnants of a stage stop, including a small cemetery.

Cultural Resource Program Problems

In undertaking a broad areal planning project numerous problems are frequently encountered, some partially or totally unresolvable.

At the general level legal mandates (FLPMA) that set a firm plan completion date, as well as time constraints set by various managers and administrators, imposed deadlines which limited the time that could be devoted to developing sampling designs, inventory, analyses and write-up. Budgetary limitations and work power ceilings are integral parts of the problems. In addition, in some cases individual training may have been insufficient in some areas of anthropology, history or environmental studies leading to minor data gaps or inconsistencies.

While a good deal of work was completed by BLM staff, considerable work was also undertaken by contractors. Although standards were imposed on contractors, flexibility for individual initiative and innovation was built into the contract. The result has been that not all data is exactly comparable across the desert. While this is only a minor problem, the reader should be advised that this situation is present and has been taken into account insomuch as possible. On the positive side novel and creative approaches have made a positive contribution to archaeological field methodology and analysis.

A major bias in the field inventory has been toward surface sites. There simply was not enough money to test for the presence of prehistoric buried sites. Since sampling was exploratory, there was not always enough time (nor available landform or other environmental data) to test any precise models of Early Human locations. This was usually done through intuitive means (with several exceptions within the Colorado Desert).

By and large the chronological placement of prehistoric sites has remained unknown since sensitive time makers are often absent or have yet to be recognized by scholars. Another bias in the site recording procedures resulted from the arbitrary time depth of 1945 set by archaeologists. Any site of cultural remains judged later than 1945 was not recorded.

Coombs (1978, 1979) has presented a detailed discussion of the problems of validity and reliability with respect to the archaeological research procedures developed and utilized in several of the desert regions. His narratives have desert-wide applicability. His duscussion of validity centers on the operational definitions of sites, briefly brought out in previous paragraphs. Coombs (1978:61) has noted:

> In short, no meaningful statements ... can be made about the set of "all past human behavior." The validity review has identified, however, that universe which may be systematically studied. Specifically, statements can be made about past human behavior which left physical indicants that are:
>
> a. recognizable to trained observers, and;
> b. present on the surface of the ground.
>
> The validity analysis has also warned us that we must be cautious of 1) the functions (i.e., the types of behavior) that we ascribe to particular collections of materials classified as sites and of 2) the conclusion we might come to concerning the relationship between the original locus of human activity and the present locus of cultural remains.

These same tests can be applied to environmental variables noted during inventory.

In addition the questions of validity should be applied to the analytical techniques and the assumptions that underlie them (cf. Coombs 1978:63).

Reliability refers to the variability in any measurement device or other research tool and the consistency with which a task is performed. We can think of this factor in terms of the ability of field crews to perform their assigned survey and recordation tasks. This may be a reflection of the weather, lighting, terrain, vegetation cover, particular crew abilities, fatigue and a number of other factors. What the reader must realize is that these factors can and probably did result in certain errors in the process. However, certain controls (cf. Coombs 1978:68) help compensate for these minor problems.

Clearly the sampling size alone can and probably has led to errors in interpretation and prediction. A 1% sample can only be considered adequate at the most general level. From a formal statistical viewpoint the sample size and configuration is inadequate for most tests. However, when prior work is taken into account and the few applicable tests considered, subjective evaluations of the data form a baseline on which to build better, more objective evaluations of what is out there, what it means and its overall significance to the public. As plan implementation proceeds, further inventory will provide a means for rectifying errors and for initiating needed amendments.

National Register Procedures

To identify cultural resources listed on, or eligible for nomination to the National Register of Historic Places, the February 6, 1979 Federal Register was reviewed and the State Historic Preservation Officer (SHPO) was consulted. In addition a number of other archaeologists and historians working on recent or current projects were contacted in order to determine if they had other properties in process of nominations or determination. BLM cultural resource personnel are aware of older nominations or determinations still in process as well as some properties where the SHPO (by correspondence) had indicated a particular property appears eligible. For the purpose of this plan and EIS all of these above properties were treated as if they were already on the National Register of Historic Places or had been determined eligible (cf. Table AF-3).

A meeting was held on September 24th and 25th, 1979, with representatives of the California State Office of Historic Preservation. As a result of this meeting BLM and the Office of Historic Preservation are working out an agreement to meet 36 CFR 800 compliance requirements with respect to the National Register of Historic Places.

Appendix 5b

Cultural Resource Program:

The Archaeological (Prehistoric and Historic) Record

For the purposes of this project an archaeological site is defined as a pre-WWII location of one or more prehistoric and/or historic activities which can be delineated specifically by the cultural remains present and is separated from other locations of prehistoric and/or historic activities by distance (greater than 50m) and/or geomorphic feature. The exceptions to this rule were determined on the basis of field judgement and represent less than 5% of the cases. As an example, a large lithic scatter or temporary camp may have cultural materials moved downslope by sheetwash more than 50m from the main site. These downslope materials were not recorded as separate sites. Obviously the perceptions of field recorders were not always the same and a certain amount of deviation in such field judgements should be expected. Overall, however, the criteria for site distinction were rigorously followed for the sake of consistency. In a few instances sites related to WWII desert military training and 1940's vintage historic events were recorded.

The cultural materials that constitute a site are basically artifacts and/or cultural features and structures. Artifacts include a wide array of tools and objects of stone, bone, wood, ceramic, metal, etc. Cultural features are specific clusters of artifacts and/or other material that exhibit structural association and that consist of nonrecoverable or composite matrices used or assembled by humans. Examples include rock art, evidence of bedrock milling, roasting pits, arrastres, rock walls, etc. Structures include houses, foundations, dugouts, etc. The smallest spatial unit with which the archaeologist deals is the site. A single isolated artifact or feature fits within the definition of a site.

Prehistoric sites are locales used by aboriginal peoples, usually for traditional activities, before the complete disruption of their lifestyle by non-native populations. Historic sites are locations utilized by more recent peoples, including Anglos, Chinese, Mexicans, Blacks, and others, up until World War II. Some sites contain both prehistoric and historic components and others may hold ambiguous or no clues as to whether they are the products of prehistoric or historic populations.

For planning and other management purposes and to facilitate discussion of prehistoric behavior within the study area, 18 prehistoric site categories ("types") and 11 historic site categories ("types") were distinguished. In retrospect we now would opt for a more descriptive classification; we avoided any change during work progress to facilitate comparability desertwide and interregionally.

Prehistoric Sites

1) Village

A wide range of cultural materials represents the apparent long-term or intense seasonal activity of a number of families at these base camps. Archaeological evidence includes artifacts associated with (a) a wide range of subsistence activities, as well as floral and faunal remains which represent subsistence activities, (b) the manufacture of other artifacts, and (c) ceremonial activities. Such a site is characterized by most or all of the following: extensive scatters and quantities of debris such as potsherds, fire-affected rock, whole and broken stone tools, chipping waste, milling tools, structural depressions or rings, hearths, rock art and mortuary remains. A well-developed cultural deposit (midden) is an essential constituent of these large sites, which in almost all cases of the systematic record exceed 1000 square meters in size and in over half the cases exceed 5000 square meters in size.

2) Temporary Camp

These sites were apparently occupied for a short length of time (e.g., one day to one month) by several people, up to a few families. Cultural remains may include a combination of scattered artifacts, tool manufacturing debris, fire-affected rocks and possibly features. Any combination of flaked stone, sherds or milling tools or milling features may be present at these open sites. There may be midden or features present such as clusters of fire-affected rock, cleared circles or rock rings. Generally these sites differ from the first site type by their smaller size (less than 15% exceed 5000 square meters in size) and lower complexity (a lower frequency and density of artifacts). These sites are inferred to represent limited camping, subsistence and maintenance activities.

3) Utilized Shelter/Cave

Any rock overhang, rockshelter, or cave with evidence of prehistoric use falls into this site category. When a shelter or cave has rock art as the only sign of utilization, the site is classified as one of the rock art site categories. While at times some attempt was made to sub-type these sites into (a) occupation, (b) transient, or (c) storage rockshelter or cave, lack of subsurface testing precluded objective categorization, and for purposes of analysis only the single category was used.

4) Milling Station

Semi-portable or bedrock milling artifacts or features (excluding isolated manos or pestles) are included in this group. The small portable tools mentioned above are lumped in the isolated find category. Milling stations include metates, bedrock grinding slicks, rubs and mortars in isolation or in groups. An occasional roasting pit or flake may be found with a group of milling features within this category. Where there was some question of categorization, the apparent primary focus of activities was considered the main factor in the classification.

5) Lithic Scatters

These sites are characterized exclusively by the presence of flaked stone tools, chipping waste, cores, retouched and utilized flakes, and/or flake material such as chalcedony, chert, obsidian, rhyolite, basalt, felsite, etc. Such sites appear to be represented by surface materials only, although some sub-surface remains could be present. This is the most frequent site category in the California Desert. About 60% of these sites within the sample are less than 50 square meters, 75% are less than 250 square meters and only 5% exceed 5000 square meters in size. Density of materials varies considerably, although at least three flakes must be present. Some of these sites may be termed secondary quarries. Here "float" material on fans or similar areas was reduced for tools, blanks, cores, etc.

6) Quarry Sites

These sites are locations where lithic materials have been extracted from a larger mass (usually crypto-crystalline), such as a seam, vein or outcrop, for the purpose of raw material procurement and eventual tool or ornament manufacture. Materials extracted include chert, basalt, obsidian, turquoise, etc. Such sites are characterized by an abundance of stone flakes, cores, occasional hammerstones, preforms, blanks or rejects. There are a few instances where the distinction between quarry and lithic scatter remains unclear.

7) Pottery Locus (scatter)

A site in this category is represented by a surface scatter of pottery (ceramic) sherds or broken vessel parts. In rare instances whole vessels may be recovered. Over 80% of the systematically recorded sites are less than 10 square meters in size.

8) Cemetery

One or more human interments comprise this site category. Surface manifestations include exposed human bone, mounding, cairns or other markers. The systematic survey resulted in the recordation of no sites of this category, although others have found such sites in the desert and several villages are known to contain human interments. Historic cemeteries are treated in the historic site classification.

9) Cremation Locus

Sites of this category are characterized by charred human bone fragments and associated blackened soil. Small circles of cobbles may also mark cremation locations. These sites are most often found in small rock cavities and dune areas. Cremations may also occur in association with other site categories such as rockshelters and villages.

10) Intaglios

These are large ground figures, abstract or animal and human forms, that have been produced by removing darker-colored desert pavement and exposing the underlying lighter-colored soils. These sites are found predominantly along the Colorado River and in the Yuha Desert.

11) Rock Alignments

Sites in this category include one or more connected or isolated courses of cobbles or boulders arranged to form lines or other designs. Such alignments vary in size and complexity ranging from simple lines to complex abstract or geometric designs. Rock rings, small enclosures of boulders (blinds?) and walls are excluded.

12) Petroglyph Site

Petroglyphs are pecked, scratched or incised figures or designs on boulders, rock outcrops or rockshelter walls. These features are usually immobile. Frequently they are associated with camps or villages.

13) Pictograph Site

Pictographs are painted figures or designs which occur most frequently on the walls of sheltered caves, boulders or outcrops.

The most frequent colors are red, black and white, although other colors such as orange, brown, yellow and green can occur. Most frequently paintings occur as features of other sites.

> Note: If both petroglyphs and pictographs are present, then the dominant rock art form (i.e., greatest number of elements) dictates the site type to be given (e.g., petroglyph site with pictographs or pictograph site with petroglyphs.) The lesser rock art form (i.e., smallest number of elements) is recorded as a cultural feature.

14) Trail

Trails are marked routes of travel between apparent villages, temporary camps, and resource procurement areas. Where they survive, trails usually are faint linear impressions or clearings in the desert pavement or slight "shelves" along hillsides and canyon slopes. Potsherds and other artifacts may occur along trails, as may rock cairns or trail shrines. Such associations are especially critical in identification where modern or relict animal trailing and past vehicle trailing has occurred. The trail is an entity in itself--a route of travel interlinking the various activity areas and sites of the aboriginal populations. However, in some cases trails may have been recorded as features of other sites.

15) Roasting Pit

Circular areas of burnt cobbles and darkened soil, sometimes with rounded depressions or mounding, characterize roasting pits. Occasionally a milling feature, several flakes or potsherds may accompany a series of roasting pits. The apparent dominant activity (remains) determines the site category.

16) Isolated Find

An occurrence of a single artifact or cultural feature that does not conform to other site categories is documented with this category. This includes isolated flaked stone tools, cores, manos, and other artifacts not covered by other site categories (e.g., an isolated metate is included in 04). One or two isolated flakes may also be recorded as an isolated find if such flakes appear exotic to the area or their human origin seems certain. Cultural features included in this site category are single rock rings or single cleared circles with no associated artifacts or other cultural features.

17) Cairn

Single or multiple piles of cobbles and/or boulders (other than those marking recognizable burials or cremations) comprise this site category. Often this is simply a single boulder or cobble placed atop another ("duck") to mark trails, etc.. Known historic cairns (e.g., mining cairns) were recorded as historic sites. There were some cases where the cairn function and age could only be guessed, based on weathering and context.

18) Other

This catch-all site category includes such features as multiple rock rings with no associated artifacts, single and multiple probable hunting blinds, other rock structures and miscellaneous features that were not readily classifiable.

Historic Sites

Historic sites were classified according to major activities: mining, railroad, military, homesteading, exploration/travel, settlement, ranching, and other. In addition, each historic site was categorized according to the categories listed below.

1) Town

A town is a compactly settled area with evidence of "permanent" buildings and a wide range of activities, the results of lengthy habitation.

2) Camp

Sites of this category consist of the remains of a few temporary habitation structures generally associated with a single major activity (e.g., mining, railroad construction, etc.) and transient use. Areas used for very short camping intervals with no structural remnants are included in this category.

3) Homestead

A tract of land sometimes with cultivated plots, that has a building (usually a small house or shack) built upon it is categorized as a homestead. Generally, these tracts were acquired from the United States Government under public land entry. In some cases, however, trespass properties are probably included.

4) Road

Known wagon and early automobile roads are classified under this site type. Often trash is found scattered along the routes. In rare instances wagon ruts may be present, such as along the Old Government Road and the Spanish "Trail".

5) Trail

Meandering foot plus saddle and pack animal routes fit this category. Historic trash usually can be found scattered along the routes.

6) Mine

This site category includes shafts, adits, tunnels and other features through which mineral substances have been extracted. Habitation structures, material processing features and other structures, and features and items that appear secondary to associated extraction activities are included.

7) Railroad

These sites include the remains of a permanent road having a line of rails fixed to ties and laid on a roadbed or berm providing tracks for railroad cars. Most historic desert railroads have only a berm or a berm and ties remaining. Camps and trashdumps associated with railroads are categorized separately.

8) Graveyard

These are cemeteries containing the remains primarily of Euro-American, Asian and other non-Indian people. Headstones, wooden crosses, mounds, elongate rock cairns, etc. mark this site category, which is usually associated with other historic material and often with a town or campsite.

9) Trashdump

These are places where historic refuse or other discarded materials have accumulated or been dumped. Dumps often occur in association with other historic features and consequently are subsumed under other categories in these cases.

10) Military

Sites of this category consist of remnants of military activities including forts, camps, outposts and redoubts (primarily 19th century) and training camps and various structures and features resulting from more recent activities through WWII.

11) Other

An extensive range of historic materials and features are included in this miscellaneous category. Included are isolated artifacts (e.g., bottles, automobiles, horseshoes), isolated features (e.g., arrastres, wells, cairns, structures, etc.) and other complexes (e.g., mills, charcoal-burning areas, graffiti, tramways, etc.).

Appendix 5c

CULTURAL RESOURCE SENSITIVITY/SIGNIFICANCE DETERMINATIONS

The concept of significance has been used in most laws, directives and regulations pertaining to cultural resource management (see Appendix 1) and is the key to the Sensitivity Mapping Record (see attached) developed by the staff. Inasmuch as each archaeological site contains bits and pieces of information that may enhance our understanding of past human activities, each site is potentially significant. However, it is generally accepted that defining significance of an archaeological phenomena requires some frame of reference, problem orientation, or geographic, temporal or other content. In the course of DPS' sensitivity analysis, locations or small regions containing or believed to contain one or a complex of sites were deemed more or less significant following the attached criteria.

The better the control of the evaluator over the topical, geographical and temporal context in which sites are located, the more effective that person can be in the assessment of the relative significance of the cultural resources of the area. By the same token, the more we know of the sites in a particular region the more confident we can be in our evaluation. If a site happens to be the only example of its type within a region or the entire desert, then we have to assume that it is highly significant.

The significance of an archaeological resource (a single site or a complex of sites) cannot be directly measured in the sense that site size, depth, and content or density of sites can be measured. Furthermore there is no absolute frame of reference that can be established against which all prehistoric or historic resources can be measured. There are many potential kinds of significance (e.g., historical, scientific, ethnic, public, geographic, etc.).

Depending on what questions are asked concerning the issues of significance, sites are deemed at this time of more or less value. The situation is further complicated by the fact that as the discipline evolves or even as public awareness changes, the degree of significance also may change. Desert locations of little concern abandoned 30 years ago may become very significant 20 years from now. In any discussion of significance, then, the cultural resource specialist must specify the frame of reference employed in evaluating the significance of the cultural remains.

The criteria most often developed in evaluating the significance of archaeological-historical remains from the standpoint of cultural resource management and the concerned disciplines includes research potential, integrity and public appreciation. The cultural resource specialists on the planning staff considered these criteria along with: historical and ethnic interest, uniqueness/rarity, site diversity, site complexity, site density, site variance, and site distribution. Some of these criteria broaden our perspective from the individual site to an area or region.

The criteria employed in the sensitivity analysis are discussed in form order. Since the criteria were designed for the determination of areas of (1) very high, (2) high, and (3) moderate, low or unknown cultural resource sensitivity/significance, a few comments concerning their delineations are in order. Because of the nature of this plan and the cultural resource inventories to date, the resources in all cases were given the benefit of the doubt. Our approach to the evaluation was liberal in this respect. So much of the desert is simply unknown in terms of prehistoric or historic remains.

Those areas of high sensitivity/significance tend more to be predictive, or represent cultural resources which have been seriously impacted or are

CALIFORNIA DESERT
CULTURAL RESOURCE SENSITIVITY MAPPING RECORD
USDI-BLM DESERT PLANNING STAFF

Polygon No. ______________________________
Planning Unit(s) ________________________
County ___________________________________
Date _____________________________________
Analysts _________________________________

A. Regional Characteristics

I. Description of Region:

II. Land Ownership:

B. Criteria

I. Site Density (desert-wide, regional, stratum):

II. Site Variance (by stratum):

III. Site Distribution (clustering)--Coefficient of Dispersion by Stratum:

IV. Site Diversity (by stratum):

V. Site Complexity (inter-and intra-site):

VI. Uniqueness/Rarity:

VII. Current Field Research Interest:

VIII. Potential Scientific Use (Interest):

IX. Aesthetic Value (for recreational use only):

X. Integrity/Surrounding Environment (inter-and intra-site):

XI. Socio-Cultural (ethnic) Use/Concern:

XII. Historic-Ethnohistoric Documentation--Heritage Interest:

C. Comments

I. Publications/Documents (informational):

II. Confidence (problems) in Rating:

III. Sensitivity Class:

IV. Recommendations for Allocation:

relatively common to the region under evaluation. Other criteria discussed below were also considered. Determinations of relative sensitivity and significance were based on one or a combination of criteria.

No single individual undertook the evaluations. Since both subjective and objective criteria were utilized (alone or in combination) some variation would be expected. By being liberal, however, the cultural resources are fairly evaluated in this exercise.

The information used in this process was extensive, including all contractor reports, site record files, general files, and other information previously listed. In addition many knowledgeable individuals were contacted for information they had. These contacts were undertaken directly or through the intermediacy of contractors. Time did not allow us to contact all of the individuals we would have liked, however.

Also, various contractors have presented sections of reports concerning an evaluation of the cultural resource significance and sensitivity of their particular study area and the desert as a whole. Some of their works have been taken into account in the process. Some salient points of these works are worth presenting at this time.

Two schools of thought exist with respect to archaeological-historical research significance (cf. Coombs 1978). The predominant opinion is that the relative importance of sites should be based on regional research problems. This approach has been criticized (cf. Glassow 1977) on the gorunds that it ignores future methodological and theoretical developments. The minority school supports establishment of significance criteria that insure that a representative sample of different site types be preserved. Archaeologists have been critical of this argument because it smacks of the "shotgun" approach of early American ethnographers. The principal distinction of the latter school is the emphasis on variety, that is, on preserving a range of site types in a range of environmental settings. In deference to the professional community, and the difference of opinions, the sensitivity analysis attempted to define areas of regional significance, as well as those incorporating variability in observed cultural phenomena.

Sites recorded during systematic sample inventory provide precise information about locations and attitudes of known sites. These site samples, taken in conjunction with subsequent analysis, provide general information about unrecorded sites - that is, the overall patterns of cultural resources and the distribution of particular site types. In this sense, many areas of high sensitivity/significance are predictive.

Site analysis revealed a number of site distribution patterns, among them higher prehistoric site densities around mesquite groves, in pinyon-juniper areas and in the vicinity of springs. In the past sensitivity/significance analyses have emphasized these areas of higher site density, at the expense of lower site density zones (sometimes including large areas) and areas containing relatively small and "simple" sites. We have attempted to rectify this situation somewhat by including regionally select zones of lower site density and site complexity in high or very high cultural resource sensitivity/significance polygons.

As a final preface to the individual criteria, a discussion of the individual criteria ratings are appropriate. Each is accompanied by a qualitative statement (high, medium, low, unknown, none) based on objective and/or subjective data. While we have tried to be as consistent as possible in these assessments, some fluctuation can be expected with individual evaluators.

Discussions among the evaluators and review by the lead archaeologist hopefully has minimized the variation.

The first four criteria (site density, site variance, site distribution and site diversity) are quantifiable desert wide, regionally or within a particular environmental domain or stratum.

I. Site Density

Site density estimates were derived according to the following formula:

$$Y = \sum_L S_L \; (A_L/a_L)$$

where, Y = the estimated number of sites in a given zone (the zone may be a sub-stratum, stratum or the total project area)

L = a given substratum (area)

S_L = the number of sites recorded within sub-stratum L, contained in the zone.

A_L = the total area within sub-stratum L, and;

a_L = the area inventoried within L.

These estimates are based exclusively on the randomly generated data of the systematic field inventories. Site densities were computed using the total number of sites observed within individual sample units. Determinations and evaluations of sensitivity and significance utilizing the above formula for mean number of sites per square mile were made on a regional basis and through comparisons of broader physiographic provinces (e.g., Colorado Desert, Great Basin, etc.) In some cases or special circumstances, general figures were extrapolated. As an example, unless we had data to the contrary, areas around springs were considered high site density areas.

It must be remembered that the formula utilized is only one estimate of site density. There is always the danger that some figures could be skewed, as in an area where most of the survey units had no sites present and one or several had a great many. Wherever possible this potential skewing was taken into consideration.

In ranking broad areas of the desert in terms of site densities we have relied on the analytical work of Gary Coombs' (1979) "An Analysis of California Desert Cultural Resource Data Preliminary Report #13, Archaeological Potential and the Ranking of Study Areas". Coombs' analysis represents an attempt to control for differences in environmental composition and to determine whether differences between study areas, in terms of site densities, remain after such controls have been implemented. These controls included the pooling of valley and playa strata, since no strong or consistent differences in site densities were apparent, and the exclusion of mesquite and pinyon-juniper strata from valley and mountain categories because of their significantly higher site densities in all areas. Based on their pooling and subsequent analysis, a basic ordering of study areas was determined as follows:

1. Anza-Borrego and Yuha (highest site densities)
2. Southwestern Great Basin, Mojave Basin, Eastern Colorado Desert and Western Colorado Desert
3. Central Colorado Desert, Northeast Mojave (lowest site densities)

All of the above information was considered in the final subjective evaluation of the region and the subsequent determination of high to very high sensitivity/ significance polygons.

II. Site Variance

Site variance was derived according to the following formula:

$$S^2 = \frac{\sum_{i=1}^{k} (X_i - \overline{X})^2}{n - 1}$$

Where S^2 = the sample variance, or an average of the squared deviations of scores from the arithmetic mean.

X_i = variate

$\overline{X}$ = mean of the sample

$n - 1$ = sample minus one

This particular measure was utilized on a regional or sub-regional basis as applicable.

In an approach which relies heavily on prediction based upon a data base which constitutes only a small percentage of the total population (i.e., sites), variance is an extremely important factor. However, it can be misleading when used without consideration of mean site density values and other criteria. For instance, different kinds of deviation from a mean can give the same variance figures. This importance of variance relates to the reliability of the predictions. Generally, the greater the statistical variance in the sample population the less certain we can be about the predictive accuracy of any model derived from correlations identified in the same population. In this case we would be inclined to adjust the weighting in sensitivity predictions to reflect this situation, i.e., areas with solid or high correlations with little variance will be considered relatively more reliable in predicting general sensitivity than areas with correlations exhibiting relatively high statistical variance. Variance figures are examined for the region under consideration and assessed in terms of other data as to the relative significance/sensitivity of the given area.

III. Site Distribution - Coefficient of Dispersion by Stratum

Site dispersion refers to the amount of clustering observed among sites in the sample. It is expressed as the Coefficient of Dispersion (CD) in the following formula:

$$CD = \frac{S_h^2}{\bar{x}_h}$$

where, $\bar{x}_h$ = the mean site density

S_h^2 = the variance of the density.

A CD roughly equal to 1.0 indicates a random distribution of sites. A CD greater than 1.0 indicates clustering among sites; a CD less than 1.0 indicates repulsion among sites.

A description of where sites seem to be clustered is often included in this category. Since this criteria is computed on a sub-regional basis (e.g., by planning unit and stratum or domain) within each general field study region or area, CD's are evaluated within that region or area in relationship to each other. Those sub-regions which are anomalous are usually afforded a relatively higher rank in the subjective evaluation of the figures. As in the other quantifiable estimates the very low sampling percentage leaves room for a considerable margin of error. In this respect this criteria was not emphasized in the overall evaluations.

IV. Site Diversity

Site diversity was derived according to the following simple formula:

$$\text{Site diversity} = \frac{\text{number of site types per stratum} - 1}{\text{number of sites per stratum}}$$

The number and types of sites present within the individual sensitivity/ significance polygons are listed in this category as well.

This criteria was used to assess polygons according to individual study regions. Precautions were taken to avoid using the absolute numbers since there are inherent problems in this measurement. The evaluations of sensitivity/ significance were judged on the basis of the index number bearing in mind that generally (1) where very few sites are present, the index is likely to be high; (2) where many sites are found, the index is likely to be low since there is a finite number of site types in the total sample; and (3) the measure doesn't deal with the unusual site type on a desert wide basis nor does it bring out site type congruence as there are only a few frequent site types.

In some cases because of the above, no significant differences were apparent. In regions with a high site density mean, a relatively high index (concentration of high numbers of many site types) was judged to be important (significant) in comparison to areas of few sites of only a few types.

V. Site Complexity

This criteria was used on a site and regional basis. The considerations included the extent of each site or sites, site components, diversity of artifacts, features and/or motifs, the density of cultural materials and the presence or possibility of paleoenvironmental/ecofactual materials. The approximate breakdown of areas and sites was considered as follows, insofar as this could be determined in the field or from the records:

Low:

Small sites, single component sites, little diversity of artifacts, features and/or motifs, low density of cultural materials, and little or no evidence of paleoenvironmental/ecofactual materials.

Moderate:

Small and medium-sized sites, single component sites, moderate diversity of artifacts, features and/or motifs, low/moderate density of cultural materials, and occasional evidence of paleoenvironmental/ecofactual materials.

High:

Large-sized sites, single to multi-component, moderate to high diversity of artifacts, features and/or motifs, moderate to high density of cultural materials, good ecofactual and paleoenvironmental possibilities.

Obviously, a polygon may be characterized by sites of low intra-site complexity yet still have high inter-site complexity or vice versa (e.g., historic and prehistoric sites).

VI. Uniqueness/Rarity

This criteria was utilized by the evaluator on a regional and sub-regional (stratum or domain) basis for individual sites based on present knowledge. Sites were evaluated according to whether they were one of a kind or one of a few sites of its kind, or the best remaining example of a particular type of activity, or combination of activities. A complex of sites with the same factors was also considered.

It is worth reiterating that defining uniqueness/rarity requires some frame of reference, problem orientation, or geographic, temporal or other context. A one of a kind site or complex of sites located in a poorly understood region may initially be considered significant. However, as data become more complete, the assessment of that archaeological phenomenon could change.

VII. Current Field Research Interest

This category was measured by reference to information related to research contained in the Class I cultural resource overviews and other publications and documents, and by reference to past, present and pending antiquity permit applications. Highest consideration was given to those areas where current (1978-79) research is underway or proposed. Lesser but considerable consideration was given to those areas or sites where there has been research within the past decade and the sites and environment retain their integrity.

VIII. Potential Scientific Use

Scientific use refers to the potential for a site or complex of sites to yield scientific data pertaining to prehistoric and historic behavioral patterns This was evaluated on the basis of historic records, the possession of unique or rare characteristics or qualities and/or the presence of an archaeological deposit in an undisturbed condition. An archaeological deposit can be defined as an artifactual/ecofactual assemblage in either a surface and/or subsurface content (see discussion on site categories). The following is a partial list of potential study topics (cf. Grady 1977) (not to be considered mutually exclusive) for both prehistoric and historic sites as applicable:

1. Cultural processes
2. Cultural dynamics
3. Settlement/subsistence studies
4. Cultural ecology
5. Architectural studies
6. Artifact typology
7. Transportation and trade
8. Social organization - patterning
9. Burial/cremation studies
10. Ceramic studies
11. Dating
12. Geo-archaeology
13. Early Human
14. Lithic artifact studies
15. Perishable studies
    Microfossil analysis
    Macrofossil analysis
16. Photogrammetry
17. Pollen studies
18. Trace element studies
19. Rock art studies
20. Historic engineering
21. Historic mining
22. Urban development
23. Military activities
24. Railroad studies

IX. Aesthetic Value (for recreational evaluations only)

The aesthetic value of a site, feature or artifact is determined by its artistic merit or the degree to which it might be expected that people will enjoy viewing it, either in situ or in a museum display, for an appreciation of its beauty. It is recognized that terms such as "artistic merit," "beauty," etc. are subjective, and people will enjoy the differing types of artifacts, features and sites for various reasons. Sites and site complexes were rated on the following scale for aesthetic value:

Very High - This category consists of sites or artifacts of an especially spectacular nature. Sites or artifacts that are in an undamaged condition or nearly so are included here. These sites can be large rock art sites (petroglyphs, pictographs, intaglios), major historic sites (e.g., mining towns and camps), or smaller sites, such as single structures. It may also include such things as undisturbed rock shelters and similar habitation sites, milling sites with an abundance of bedrock mortars or grinding slicks, trail systems, and even single artifacts, such as an undamaged projectile point, basket, ceramic pot, early mining equipment, etc. Many sites, features or artifacts in an undamaged condition might be expected to give pleasure to some viewers.

High - This category includes less spectacular common site types or those as above that have suffered some damage so that they can no longer be considered pristine or whole. The site or artifact must still be essentially intact.

Medium/Low - This category includes sites or artifacts that have been seriously enough damaged or worn away through weathering and/or erosion that they are no longer intact. It also includes such site types as single mortars or historic objects, lithic scatters, sherd scatters, rusted tools, etc., that, while they may be interesting for other reasons, have little or no inherent aesthetic value for the layperson by today's standards.

X. Integrity/Surrounding Environment

The potential for cultural resources to contribute to our understanding of past peoples is largely a function of their condition and can be referred to as the integrity of the resource, relative to research significance. A determination of the research potential of a site or complex of sites is dependent upon an accurate assessment of the natural and cultural disturbances to the sites and surrounding areas. A site which is physically intact, in whole or part, and assumed to be reasonably similar to the condition when last occupied, is said to have maintained its optimum integrity. This also includes integrity of the environmental setting of the area in the vicinity of the site. Overall ratings fall into the following three categories:

I. Low - Where damage to a site or sites and environs are extensive and irreversible. When:

A. Natural forces have effected a substantial change on the site or sites or surrounding environ through:

1) Dissection or degradation by sustained gullying, rilling, colluvial activity, or flash flood, therefore displacing or extremely altering the site or surrounding landscape.

2) Native or domestic faunal disturbance by extensive rodent burrowing, erosion induced by overgrazing of cattle or sheep, artifact breakage by hooved animals such as burros, trailing, wallowing, etc.

3) Floral disturbance or change where the site is nearly destroyed by vegetation growth or the pre-contact native flora has been displaced by imported species.

4) Physical alteration by rockslide, talus accumulation, slumping, etc.

B. Human forces have effected a substantial change through;

1) Conscious activity such as pothunting or vandalism.

2) Unconscious destruction through recreational activity (e.g., ORV use, horseriding) or technological pursuits (e.g., utility construction, mining, or ranching) which have removed the great majority of the site or substantially altered the surrounding area with material objects (e.g., buildings, roads, trash).

II. Medium - Where physical damage or degraded environmental condition is moderate and has not totally destroyed the content/context of a site or sites. Where recent human or natural degradation can be mitigated or halted in a cost efficient or regulatory manner. When:

A. Natural weathering, erosion, and biotic disturbance has proceeded causing:

1) A loss of some information through artifact/ecofact displacement but the site activity can be basically discerned through the remaining data. Where a site in its context is imminently threatened by

these forces, simple physical measures (vegetative removal, erosion, stabilization) to protect the resource and surrounding environ, should be sufficient.

2) It is assumed that natural biotic succession accompanied by ongoing landform change will alter the ecological setting of the environ somewhat but would neither eliminate all paleoenvironmental data nor would this necessitate human intervention.

B. Human forces have resulted in a loss of data through:

1) Minor collecting or disturbance of the site.

2) The appearance of recent materials in the vicinity which have impacted the site or environ.

3) The site and area integrity have sustained damage which can be mitigated by material removal, (trash, etc.), camouflage on necessary structures, rerouting of roads to lessen impacts on site and area.

III. High - Where the site(s) and/or surrounding environ has sustained little damage or disturbance to its integrity. When:

A. Natural erosion or biotic disturbance of the site and environ have been minimal or negligible resulting in a relatively pristine setting altered only by the passage of time.

B. Human forces have had little prolonged effect (i.e., ephemeral) through their activities (subsistence, traveling, prospecting, some forms of recreation, etc.).

This category would necessarily have the best content/context of archaeological data as most of any given site(s) is intact and environmental data is relatively complete.

XI. Ethnic Use/Value

Individual sites or groupings of sites and their surrounding environment that have special significance to a Native American and other groups are said to have ethnic value. Given BLM's specific task of representing and incorporating the concerns of the contemporary Native American community, primary attention was given to recent (less than 10 years) interview data and BLM/DPS ethnographic records. Due to the variation in the concerns and criteria by which various groups with traditional homelands in the CDCA determine "significance" and "sacred" status of sites, it was decided that interview notes be the basis for evaluating ethnic concerns.

Certain uniformities in the evaluation procedures were applied. All areas specifically identified by Native Americans as being "sacred" or as having explicit ritual associations were considered of "high" sensitivity. Areas of demonstrated occupation by predecessors of contemporary populations were in most cases categorized as moderate in sensitivity. Certain of these areas having associations with Native American oral narratives and myths may, however, be areas of "high" sensitivity. Only areas not mentioned and sites not known to contemporary Native American informant populations may fall into the "low" sensitivity category. It must be recognized that less than 5% of the Native American people were interviewed.

Other ethnic concerns are recognized, although even less interviewing has been completed. (These include Asian and Mexican-American). The concerns of these groups were considered relative to the above comments.

XII. Historic-Ethnohistoric Documentation

Historic-ethnohistoric documentation is based on information provided in the Class I cultural overviews, other background studies and documents and other archaeological, ethnohistorical or historical publication. References to given sites, features or regions are considered in this criteria on a desert-wide basis.

While no pretense is made at knowing the entire literature base, some sites or locations are obviously described more often in more detail. These become more important for the purposes of this criteria only. Where there is no known documentation for a given location or area it is rated low. Moderate to high value is subjectively placed on other locations or areas depending on the level of documentation.

Appendix 5d

Cultural Resources Program: Mitigation

Mitigation is a complex set of alternatives designed to reduce or alleviate the adverse impact of land alteration activities on natural and cultural resources. Mitigation is usually accomplished in one or combination of three ways, specifically (1) avoidance of the resource base, (2) preservation of the resource base and (3) adequate study of the resource base. It is noteworthy that adequate study (or "salvage") is not the only mitigation measure available and in many cases is the least preferred approach.

Mitigation may alleviate effects from direct, indirect, and/or potentially adverse impacts. Direct impacts are the immediately demonstrable effects of a land modification activity on cultural resources. Mitigation of these impacts is entirely the responsibility of the project sponsor. Indirect impacts are secondary effects resulting as a spin-off from a land modification activity. Effects are not likely to have occurred within a predictable time span without the activity. A specific example is increased erosion of sites because the project has altered drainage patterns. The responsibility for mitigation of these impacts is less clearly defined, although precedent exists for the sponsor to mitigate where there are clearly predictable indirect impacts. Potential impacts are the result of associated developments which are likely to occur as a consequence of a project, but are dependent on other variables, particularly socio-economic. Intensified recreational use or increased urban development as a result of this plan are examples of potential impacts. Because these impacts are often difficult to assess, in most cases no mitigation occurs. Proper implementation of the protection or balanced plan alternative would serve to partially alleviate these impacts.

Generally speaking, then, the direct impacts and the clearly predictable indirect impacts can be ameliorated, and mitigation is the obvious responsibility of the project sponsor. The less predictable effects, including the potential impacts, can reasonably only be alleviated if they are clearly identified at an early stage following plan adoption, and developed as a part of the total mitigation program.

It was noted at the outset that mitigation is a complex set of alternatives designed to reduce or remove adverse impacts through avoidance, preservation and investigation of the resource base. The mitigation measures appropriate to each alternative are listed in Table 1. Avoidance coupled with preservation is the preferred form of mitigation. Data recovery or excavation is usually applied where impacts to the cultural resources are unavoidable. Scientific investigation constitutes an irreversible and irretrievable commitment of the resource because it results in reduction of the resource base. Even where data recovery is applied, there is loss of information because less significant sites or portions of sites remain unexcavated because of funding, time or other constraints. Also, recovery or excavation is accomplished utilizing current techniques and theoretical assumptions, and precludes the use of more sophisticated approaches in the future. Paradoxically, it may be preferable to obtain some information now rather than possibly no information in the future because the site has been destroyed. Archaeological resources which are lost to study as a result of these limitations in contemporary recovery techniques represent unavoidable adverse effects. The cost of the unavoidable effects can be quantified. It represents the difference between the cost of total recovery and the cost of mitigation.

Mitigation effectiveness is an important issue to be considered in the planning effort. Without increases in rangers, appropriations for data recovery and construction of protective devices, and proper staff capabilities there will be continued and very serious loss of the cultural resources of the Desert. Even with the appropriations and increases in needed personnel the effectiveness of the mitigation programs will depend on a centralized and well-coordinated program under the immediate direction of the cultural resource lead. This program will have to be long range as well, to complement the proposed 20 year duration of the plan. As with the plan, periodic updates and amendments will be a matter of course. In the case of non-Bureau initiated actions resource risks will have to be evaluated with follow-up surveys. Where cultural resources cannot be avoided or impacts otherwise ameliorated, then the cost of scientific investigation must be borne by the sponsor. Bureau initiated actions as an outgrowth of this plan will have to undergo similar environmental review. Any mitigation of resources subject to impacts will have to be developed in coordination with the State Historic Preservation Officer and the Advisory Council on Historic Preservation following 36-CFR-800 guidelines.

Finally, when a plan alternative is accepted and implementation is initiated, a specific evaluation of those areas of cultural resources most seriously threatened by general uses will have to be undertaken (and re-evaluated each year). Thereafter, mitigation measures as necessary over and above the guidelines for use must be agreed upon by appropriate parties and available funding directed accordingly to ameliorate the situation.

Mitigation Overview - Native American Values

Identified potential impacts to resources of value to Native Americans are of two principal types: ideological and material.

In some cases material impacts may be alleviated. However, this is seldom the case with activities which are considered sacrilegious or desecrating by Native People.

Material impacts are primarily limited to construction damage and the secondary localized effects of the increased public access provided along service roads.

In those cases where the impacted resources include traditional collection areas of contemporary use, mitigation may be possible by providing comparable areas of similar quality for the same traditional collection activities elsewhere. Ritual sites and areas of religious significance cannot be mitigated in this fashion. Additionally, some areas of collection may be considered the sole source of acceptable traditional resources.

Impacts to areas of ritual and religious value can only be fully assessed in conjunction with religious practitioners and traditionalists who are affected. Many of the impacts to these values will not be amenable to mitigation. Various impacting activities and the implications of the impacts on Native American traditional values exhibit substantial inter-group variability. A single activity, e.g., the construction of a power transmission line, may be determined to have different potential impacts for a number of Native American groups on areas of traditional value. Some sensitive areas identified in the Native American Element are used contemporaneously by four or more ethnic groups/sub-groups. Such areas often contain a diversity of impactable resource values. While some of these values can be mitigated, others cannot. Ideal management practices in the context of this resource would be to minimize impacts by the careful siting of consumptive activities and to maximize possible mitigation.

Element Activities & Major Impacts (Negative)	Type of Impact	Mitigation Measures*	Effectiveness of Mitigation
Land Tenure			
Transfer			
Opportunity for additional scientific work may be lost.	Direct	III	Moderate
BLM no longer responsible for sites.	Direct	None	--
Inadequate mitigation likely on large land transfers.	Direct	Unavoidable adverse impacts	--
Acquisition			
Acquisition for recreational purposes may be damaging.	Direct	I, II, III	Unknown
East Mojave National Park			
Drastic increase in visitor use increasing vandalism, inadvertent damage.	Direct	I, II, III	Moderate
Overflow of people to surrounding areas, service construction.	Indirect	I, II	Low
Facility construction for visitor use.	Direct	I, II, III	High

*I - Avoidance
II - Preservation
III - Investigation

Element Activities & Major Impacts (Negative)	Type of Impact	Mitigation Measures*	Effectiveness of Mitigation
East Mojave National Park (cont'd)			
Partial data recovery because of constraints	Direct	Unavoidable adverse impacts	--
Recreation			
Collection of cultural remains.	Direct, Indirect	I, II	Unknown
Recreationalists trample sites.	Direct	I, II	Unknown
Construction of recreational facilities.	Direct	I, II, III	High
Increased visitor use.	Indirect	I, II	Unknown
Partial data recovery because of constraints.	Direct	Unavoidable adverse impacts	--

Element Activities & Major Impacts (Negative)	Type of Impact	Mitigation Measures*	Effectiveness of Mitigation
Wild Horses & Burros			
Trampling of sites.	Direct	III (Data recovery from herd concentration areas)	Moderate
Cutting of trails, particularly around springs.	Direct	I, II, III	Low
Dust wallowing.	Direct	None	--
Rubbing against structures & rock art surfaces.	Direct	I, II	Moderate
Modification of soil.	Direct	I, II	Low to Moderate
Introduction of new pollens into rock shelters.	Direct	I, II	Low to Moderate
Grazing			
Trampling of sites.	Direct	III (Data recovery from herd concentration areas)	Moderate
Accelerated erosion	Indirect	I, II, III	Unknown
Facility construction.	Direct	I, II, III	High
Wildlife			
Developments associated with wildlife management.	Direct	I, II, III	Moderate

Element Activities & Major Impacts (Negative)	Type of Impact	Mitigation Measures*	Effectiveness of Mitigation
Utility			
Construction of facilities (including upgrading, & subsurface construction).	Direct	I, II, III	High
Recreationalists make use of new roads.	Indirect	I, II	Low
Partial data recovery because of various constraints.	Direct	Unavoidable adverse impact	--
Visual intrusions to cultural resources.	Direct	I	High
Energy & Utilities			
Wind Generating Sites			
Construction of facilities.	Direct	I, II, III	High
Enhanced access.	Indirect	I, II	Low
Partial data recovery because of various constraints.	Direct	Unavoidable adverse impact	--
Alteration of drainage patterns leading to accelerated erosion.	Indirect	I, II	Unknown
Visual intrusions to cultural resources.	Direct	I	High

Element Activities & Major Impacts (Negative)	Type of Impact	Mitigation Measures*	Effectiveness of Mitigation
Microwave Facilities			
Same as wind generating sites			
Plant Siting			
Same as wind generating sites			
KGRA			
Same as wind generating sites			

Element Activities & Major Impacts (Negative)	Type of Impact	Mitigation Measures*	Effectiveness of Mitigation
Motorized Vehicle			
Machines provide increased access to remote areas.	Indirect	I, II	Unknown
Surface indications of sites are obliterated.	Direct	I, II, III	Unknown
Gully networks are established and erosion is accelerated.	Indirect	I, II	Unknown
Rapid breakdown of soils and pavements.	Direct	I, II, III	Unknown
Destruction of natural ecosystem surrounding sites.	Direct	I, II, III	Unknown
Stripping of vegetation, accelerating erosion.	Direct, Indirect	I, II, III	Unknown
Existing Roads & Trails			
Continued degradation of sites.	Direct	III	Unknown
Induced erosion.	Indirect	I, II	Unknown
Roads/trails widened.	Direct	I, II, III	Unknown
Shortcuts developed.	Direct	I, II, III	Unknown
Parking & off-road travel.	Direct	I, II, III	Unknown
Increased access to remote areas.	Indirect	I, II	Unknown

Element Activities & Major Impacts (Negative)	Type of Impact	Mitigation Measures*	Effectivensss of Mitigation
Designated Roads & Trails			
Same as for existing roads/trails except fewer routes - intensity of use more focused.			

Recovery

Test excavation
Topographical studies
 (agricultural
 features)

Data recording
 Photography
 Drafting/illustration
 Data computerization

Analysis

Obsidian hydration
Radiocarbon
Thermoluminescence
Amino Acid

Geology
 Lithologic studies
 Soil analysis
  (chemical, etc.)
 Depositional studies

Lithic artifact studies

Perishable studies
 Microfossil analysis
 Macrofossil analysis

Photogrammetry

Pollen studies

Shell studies

Trace element studies

Write-up/Publication

APPENDIX 6a

Summary of Impacts to Recreational Opportunities

		Alternatives		
Loss of Opportunities	NA	P	B	U
Hunting	4,069,760a	-23,000a	-62,000a	-89,000a
% loss		1% loss	2% loss	2% loss
Vehicle free play	924,000	-812,000a	-573,000a	No loss
% loss		88% loss	62% loss	
Rock collecting	860,800a	No loss	No loss	3,800a
% loss				1% loss
Floral Displays	1,241,600a	172,000a	198,000a	246,000a
% loss		14% loss	16% loss	20% loss
Loss of primitive experiences along ____ miles of utility corridor in MUC L		960 miles	510 miles	190 miles
Gain in Opportunities				
New vehicular access		50 miles	130 miles	
Vehicle free play	924,000	No gain	No gain	835,000a 90% gain
% gain				

NA = No Action
P = Protection
B = Balanced
U = Use

APPENDIX 6b

Summary of Recreation Resources Percent in Each Grazing Allotment

The table following describes the existence and areal extent, in acres, of wilderness study areas, natural and cultural resources, acquisition opportunities (hunting, rock hounding, etc.), present in each grazing allotment. The legend below explains abbreviations:

N/C = Natural-Cultural
MV = Motor Vehicle
ACQ = Acquisition
B = Birdwatching
F = Floral
I = Interpretive

APPENDIX 6b

Alternative P B U

NAME	WSA	AREA	NAT. CULT.	AREA	MOT. VEH.	AREA	ACQ.	AREA	REMARKS
Fish Lk. Vly.	X	1,482	0	0	0	0	0	0	Cattle/No N/C/No Acq./No MV
Bar 99	X	10,937	0	0	0	0	0	0	Cattle/No N/C/No Acq./No MV
Deep Springs	X	71,033	X	34,422	0	0	X	640	Cattle/B,F/Rock Col.
Last Chance	X	75,769	X	0	0	0	X	4,736	Cattle/Hunting D, C
Oasis Ranch	X	17,171	X	458	0	0	0	0	Cattle/B, F/No Acq.
So. Oasis	X	6,530	0	0	0	0	0	0	Cattle/No N/C
Darwin	0	0	X	578	0	0	X	578	Horses/I/Rock Col.
Hunter Mtn.	X	33,126	X	0	0	0	X	2,760	Cattle/Hunting-Rock Col.
Lacy Cactus-Mtn.	X	20,933	X	4,000	0	0	X	29,306	Cattle,I/hunting-Rock Col.
Olancha Com.	X	727	X	0	0	0	0	0	Cattle
Tunawee Com.	X	6,432	X	2,573	0	0	X	6,432	Cattle/Sheep/ACEC, F B/Hunting Rock Col.
Antelope Vly.	0	0	0	0	0	0	0	0	Sheep
Bissel	0	0	0	0	0	0	X	640	Sheep/No N/C/Rock Col.
Cantil Com.	X	30,600	X	122,340	X	4,590	X	91,800	Sheep/B,F,I/Hunting Rock Col.

Monolith Cantil	0	0	X	12,482	0	0	0	0	Sheep/F,B
Oak Creek	0	0	0	0	0	0	0	0	Cattle/No N/C
Rudnick Com.	X	16,238	X	60,892	X	8,119	X	60,892	Cattle, B,F,I, hunting
Warren	0	0	0	0	0	0	0	0	Sheep/No N/C
Walker Pass	X	45,000	X	33,750	0	0	X	67,500	Cattle/F,B
Pahrump Vly	X	7,372	0	0	0	0	0	0	Cattle/No N/c/No Acq.
Hanson	0	0	X	6,480	0	0	X	3,040	Cattle/F,B, Hunting, Rock Col.
Boron Sheep	0	0	X	898	0	0	X	149	Sheep/I,F,B/Rock Col.
Buckhorn Cyn.	0	0	X	0	0	0	X	638	Sheep/Hunting
Goldstone	0	0	X	1,801	0	0	X	450	Sheep/ACEC/Rock Col.
Granite Mtns.	0	0	0	0	0	0	X	5,146	Cattle/Hunting
Gravel Hills	0	0	X	19,243	0	0	X	12,862	Sheep/B,F/Hunting
Harper Lk.	0	0	X	4,060	0	0	X	3,384	Cattle/B,F/Hunting
Lava Mtns.	X	16,830	X	4,208	0	0	X	49,152	Sheep/ACEC/B,F,I/Hunting Rock Col.
Pilot Knob	X	19,661	X	2,949	0	0	0	0	Cattle/ACEC/No Acq.
Shadow Mtns.	0	0	X	0	0	0	X	640	Sheep/Rock Col.
Spangler Hills	X	5,686	X	5,686	X	8,530	X	8,530	Sheep/F,B,I/ACEC/Hunting Rock Col.
Stoddard Mtns.	0	0	X	9,451	0	0	X	37,806	Sheep/I,F,B/Rock Col. Hunting

Superior Vly.	X	2,051	X	49,309	0	0	X	13,806	Sheep/F,B,I/ACEC/Hunting Rock Col.
Valley Well	0	0	X	640	0	0	X	640	Cattle/I/Hunting
Newberry/Ord.	X	5,305	X	26,525	0	0	X	35,366	Cattle/F,B,I/Hunting Rock Col.
Rattlesnake Ca.	X	12,285	X	2,457	0	0	0	0	Cattle/I/No Acq.
Whitewater Cyn.	X	844	0	0	0	0	0	0	Cattle/No N/C/No Acq.
Afton Cyn.	X	54,373	X	20,913	0	0	X	25,905	Cattle/I/ACEC, F, B, Hunting-Rock Col.
Clark Mtn.	X	24,976	X	28,544	0	0	X	21,408	Cattle/Hunting/ACEC, I
Colton Hills	X	28,778	X	28,778	0	0	X	21,583	Cattle/Rock Col./F,B,A/I
Crescent Pk.	X	24,960	X	4,680	0	0	X	9,360	Cattle/Hunting - Rock Col. F
Cronese Lk.	X	44,625	X	5,100	0	0	0	0	Cattle/I/No Acq.
Granite Mtn.	X	292,375	X	128,000	0	0	0	0	Cattle/B,F, ACEC, I/No Acq.
Gold Valley	X	4,759	X	158	0	0	X	2,380	Cattle/Hunting - Rock Col.
Horsethief Spr.	X	59,836	X	27,198	0	0	X	32,638	Cattle/ACEC/Hunting - Rock Col.
Kessler Spr.	X	70,162	X	23,387	0	0	X	58,468	Cattle/Hunting Rock Col/F, I
Lanfair Valley	X	152,799	X	67,910	0	0	X	67,910	Cattle/Hunting/I, T&R/ACEC
Piute Valley	X	6,694	X	8,317	0	0	0	0	Horse/Cattle, F
Round Valley	X	268	0	0	0	0	0	0	Cattle

Valley View	0	0	X	54,301	0	0	X	203,629	Cattle/Hunting - Rock Col./ACEC F, I
Valley Wells									Cattle
Ford Dry Lk.	X	5,727	X	4,772	X	15,271	X	4,772	Sheep/Hunting Rock Col./ACEC I/Open Area
Jean Lk.	0	0	0	0	0	0	0	0	Cattle
Lazy Daisy	X	27,970	X	4,516	0	0	X	4,516	Cattle/Hunting, I
Sheep Driveway	0	0	0	0	0	0	0	0	Sheep Intensive Use Along Route (Incl. in other allotments)
(Proposed Allotments)									
Tecopa	X	72,000	X	19,200	0	0	X	4,500	I/Rock Col.
Rattlesnake Cyn. Ext.	X	23,616	X	1,812	0	0	0	0	F,B,P/No Acq.
Johnson Valley	X	11,500	X	11,500	X	39,000	X	69,000	F,B,I/Rock Col. Hunting
Ludlow	X	14,080	X	17,600	0	0	X	3,520	F,B/Rock Col.
Round Mt.	0	0	0	0	0	0	0	19,840	No N/C/Rock Col. Hunting
Chemehuevi	X	21,000	X	21,000	0	0	X	21,000	Rock Col/I,F
Rice Valley	X	10,000	X	2,000	0	0	0	0	ACEC
Palen	X	33,500	X	6,700	0	0	0	0	ACEC/F
Ford Dry Lake Annex	X	1,920	X	1,920	X	26,880	X	3,840	ACEC/I/Hunting Rock Col.
Homewood Cyn.	X	140	X	1,400	--	--	X	1,400	Rockhounding/ACEC-Int.

Death Valley Junction	X	6,900	--	--	--	--	--	--	
Lanthrop Well	--	--	--	--	--	--	--	--	
Granite Mt. Ext.	X	8,000	X	1,200	--	--	--	--	B,F

APPENDIX 6c

Summary of Recreational Resources Percent in Each Open Area by Alternative

The following table may be interpreted by the key below:

N/C = Natural/Cultural
MV = Motor Vehicle
ACQ = Acquisition
B = Birdwatching
F = Floral
I = Interpretive

APPENDIX 6a

Alternative P B U

NAME	WSA	AREA	NAT. CULT.	AREA	MOT. VEH.	AREA	ACQ.	AREA	REMARKS
Johnson Valley			X	19.2			X	32	B,F/Hunting
Dumont Dunes			X	4.2			0	0	B,F
Orocopia			X	1.6			X	0.3	Hunting/I
Gecko Campground			X	21.7			X	2.2	Hunting/I
Buttercup			X	12.4			X	3.7	Hunting/I,B,F
Plaster City			X	1.4			X	1.0	Hunting, Rock Col./I
Johnson Valley			X	56			X	67	Hunting, Rock Col./B,F,I
Dumont Dunes			X	4.2			0	0	F,B
Gecko Campground			X	21.6			X	2.2	Hunting/I
Buttercup			X	13.4			X	4.0	Hunting/I,B,F
Plaster City			X	14.8			X	9.9	Hunting, Rock Col./B,F,I
Panamint Dunes			0	0			0	0	
Spangler Hills			X	48.6			X	81.0	Hunting, Rock Col./B,F,I, Equestrian
Jawbone Canyon			X	8.7			X	9.0	Hunting/B,F

Dove Springs	X	3.5	0	0	
Rand Mountain	X	0.2	X	1.1	I/Hunting, Rock Col./B,F, Equestrian
Yuha	0	0	0	0	
Stoddard Valley	0	0	0	0	Hunting, Rock Col.
Rand Mountain	X	31.2	X	26.0	I/Hunting, Rock Col., Equestrian
Johnson Valley	X	99.1	X	79.3	B,F,I, Hunting
Dumont Dunes	X	4.2	0	0	B,F
Painted Canyon	X	7.2	X	7.2	Hunting/I
Orocopia	X	108	X	21.5	Hunting/Rock Col./F,B,I
N. Algodones	X	22.7	X	2.3	Hunting/I, ACEC
S. Algodones	X	152.6	X	193.3	Hunting/I,B,F
Plaster City	X	38.8	X	9.7	Hunting, Rock Col./ACEC, I
Spangler Hills	X	30.7	X	61.4	B,F,I/Hunting, Rock Col., Equestrian
Jawbone Canyon	X	7.8	X	8.7	B,F/Hunting
Dove Springs	X	3.5	0	0	B,F
El Mirage	X	0.4	0	0	I
Stoddard Valley	X	6.8	X	109.6	I,B,F/Hunting/Rock Col.
McCoy Valley	0	0	X	12.7	Hunting

Blythe	X	45.2	X	113.0	Hunting/Rock Col/1
Arroyo Salada	X	2.7	X	1.8	Rock Col./1
Panamint Dunes	0	0	0	0	
Panamint Valley	X	0	0	0	S
Yuha	0	0	0	0	
Bristol-Cady-Devil's Playground	X	74.8	X	187.0	I,B,F, ACEC/Hunting, Rock Col.

APPENDIX 6d

Statistical Summary of Visitor Use in Off-Road Vehicle Open Areas

The tables following show, for each open area designated in each of the four alternatives, the following data:

1.	Popular name	
2.	Poly:	The planning area reference number in which the open area is located (see multiple use class maps)
3.	Area:	Areal extent of concentrated use zones within the open area in square miles
4.	Acres:	The above amount expressed in acres
5.	Rate:	The annual rate of increase of visitor use
6.	VUD:	Total 1978 visitor use days in that area
7.	/SQMI:	Visitor use days per square mile (VUD divided by Area)
8.	1980:	Projected 1980 VUDs for that area
9.	/SQMI:	1980 VUDs per square mile
10.	2000:	Projected 2000 VUDs for that area
11.	/SQMI:	2000 VUDs per square mile

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:UDD:RECREATION:VUD2:VUD.....                                                                  11-FEB-80  16:11:51  PAGE 1


                 BALANCED

     POPULAR NAME                     POLY     AREA     ACRES      RATE   VUD     /SQ MI      1980    /SQ MI      2000    /SQ MI

     JOHNSON VALLEY                    38C        0          0      .0         0         0          0         0          0         0
     JOHNSON VALLEY                    40C        0          0      .0         0         0          0         0          0         0
                                                213     136320     1.0     74844       351      76348       358      95020       446
     DUMONT DUNES                      55P        4       2560      .5     78153     19538      78936     19734      88088     22022
     GECKO CAMPGROUND                 103C       21      13440     1.0    357626     17029     364813     17372     454075     21622
     BUTTERCUP                        103C       13       8320     1.0    105249      8096     107360      8258     133630     10279
     STODDARD VALLEY                   36P       66      42240      .5     76048      1152      76810      1163      85715      1299
     PLASTER CITY                     106P       50      32000      .5     15709       314      15866       317      17704       354
     SPANGLER HILLS                    28F        0          0      .0         0         0          0         0          0         0
     SPANGLER HILLS                    27D        0          0      .0         0         0          0         0          0         0
                                                162     103680      .5     93305       576      94321       582     105257       649
     JAWBONE CANYON                    19C        9       5760      .5     63431      7047      64066      7118      71494      7943
     DOVE SPRINGS                      19D        5       3200      .5     49750      9950      50240     10048      56070     11214
     RAND MOUNTAINS                    21C        0          0      .0         0         0          0         0          0         0
     RAND MOUNTAINS                    21D        0          0      .0         0         0          0         0          0         0
                                                  3       1920      .5    149677     49892     151177     50392     168705     56235
     PANAMINT DUNES                    15P        1        640      .5         0         0          0         0          0         0
     YUHA                             106F        1        640      .5     25078     25078      25320     25320      28266     28266
         TOTALS                                 540     350720          1088950    139026    1105281    140676    1304046    160333
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              USE

 POPULAR NAME                             POLY     AREA     ACRES      RATE   VUD      /SQ MI       1980    /SQ MI       2000     /SQ MI

 RAND MOUNTAINS                            21       110     70400      1.0  149677     1360       152685    1388        190044     1727
 JOHNSON VALLEY                            40       359    229760       .0       0        0            0       0             0        0
 JOHNSON VALLEY                            30C       20     12800       .0       0        0            0       0             0        0
                                                    379    242560      1.0   89976      237        91784     242        114242      301
 DUMONT DUNES                              55A        4      2560       .5   78153    19538        78936   19734         88088    22022
 PAINTED CANYON                            97B        7      4480       .5    6511      930         6576     939          7338     1048
 OROCOPIA                                  97C      108     69120       .5   22404      207        22628     209         25252      233
 NORTH ALGODONES                           103A      23     14720       .5   21970      955        22190     964         24763     1076
 SOUTH ALGODONES                           103C     204    130560       .5  426112     2088       430302    2109        480283     2354
 PLASTER CITY                              106B      65     41600       .5   15709      241        15866     244         17706      272
 SPANGLER HILLS                            28B       40     25600       .0       0        0            0       0             0        0
 SPANGLER HILLS                            27B      134     85760       .0       0        0            0       0             0        0
                                                    174    111360       .5   95073      546        96025     551        107159      615
 JAWBONE CANYON                            19C        9      5760       .5   63431     7047        64066    7118         71494     7943
 DOVE SPRINGS                              19B        5      3200       .5   49750     9950        50248   10049         56074    11214
 EL MIRAGE                                 31B        8      5120      1.0   90411    11301        96308   12038        119873    14984
 MCCOY VALLEY                              92B       99     63360       .0       0        0            0       0             0        0
 MCCOY VALLEY                              92A       54     34560       .0       0        0            0       0             0        0
 MCCOY VALLEY                              93C       24     15360       .0       0        0            0       0             0        0
                                                    177    113280       .5    1898       10         1917      10          2139       12
 BLYTHE                                    28B      113     72320       .0       0        0            0       0             0        0
 BLYTHE                                    29A      122     78080       .0       0        0            0       0             0        0
 BLYTHE                                    29B      119     76160       .0       0        0            0       0             0        0
 BLYTHE                                    100A      91     58240       .0       0        0            0       0             0        0
                                                    445    284800       .5   94318      212        95263     214        106308      238
 ARROYO SALADA                             105C      18     11520      1.0       0        0            0       0             0        0
 PANAMINT DUNES                            15C        3      1920       .5       0        0            0       0             0        0
 PANAMINT VALLEY                           24C        3      1920       .5       0        0            0       0             0        0
 PANAMINT VALLEY                           15B        5      3200       .0       0        0            0       0             0        0
                                                      8      5120       .5     861      107          869     108           970      121
 BRISTOL-CADY-DEVIL'S PLAYGROUND           59B      138     88320       .0       0        0            0       0             0        0
 BRISTOL-CADY-DEVIL'S PLAYGROUND           63A      401    256640       .0       0        0            0       0             0        0
 BRISTOL-CADY-DEVIL'S PLAYGROUND           58B      209    133760       .0       0        0            0       0             0        0
                                                    748    478720      1.0   72882       97        74346      99         92537      123
 YUHA                                      106E       1       640      1.0   25028    25028        25531   25531         31777    31777
 STODDARD VALLEY                           36B      248    158720      1.5  119579      482       123193     496        170933      689
    TOTALS                                         4675   2992000          1027743    80843      1448818   82051       1706982    96758
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:UDD:RECREATION:VUDS:VUD.....                                                                                11-FEB-80  16:11:51  PAGE 3


                  PROJECTION

 POPULAR NAME                     POLY    AREA    ACRES     RATE   VUD     /SQ MI      1980    /SQ MI      2000    /SQ MI

 JOHNSON VALLEY                   40C      128     81920    1.0    74844      584      76349      596      95029      742
 DUMONT DUNES                     55C        4      2560     .5    78153    19538      78936    19734      88088    22022
 OROCOPIA                         27C        2      1280     .5     9646     4823       9742     4871      10872     5436
 GECKO CAMPGROUND                 103C      22     14080    1.0   357626    16255     364813    16582     454075    20639
 BUTTERCUP                        103E      12      7680    1.0   102107     8508     104159     8679     129644    10803
 PLASTER CITY                     106B       7      4480    1.0     4834      690       4931      704       6137      876
    TOTALS                                 175    112000          627210    50401     638930    51168     783847    60521
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            NO ACTION

POPULAR NAME                        POLY    AREA    ACRES   RATE    VUD    /SQ MI      1980   /SQ MI      2000   /SQ MI

PANAMINT VALLEY                      24B      23    14720    .5      340       14       343       14       383       16
OLANCHA                              16A      47    30080    .0     4211       89      4211       89      4211       89
DOVE SPRINGS                         19C       9     5760    .5    55969     6218     56530     6281     63084     7009
JAWBONE CANYON                       19B      11     7040    .5    63431     5766     64066     5824     71494     6499
RAND/SPANGLER HILLS                  21A       0        0    .0        0        0         0        0         0        0
RAND/SPANGLER HILLS                  21B       0        0    .0        0        0         0        0         0        0
RAND/SPANGLER HILLS                  27B       0        0    .0        0        0         0        0         0        0
                                             236   151040   1.0   249592     1057    254608     1078    316905     1342
DUMONT DUNES                         55B       8     5120    .5    78153     9769     78936     9867     88088    11011
UPPER JOHNSON VALLEY                 40A     303   193920   1.0    89533      295     91332      301    113679      375
FORD DRY LAKE                        96B       0        0    .0        0        0         0        0         0        0
FORD DRY LAKE                        99C       0        0    .0        0        0         0        0         0        0
                                             160   102400    .5    78672      491     79460      496     88673      554
MCCOY VALLEY                         92B       0        0    .0        0        0         0        0         0        0
MCCOY VALLEY                         93C       0        0    .0        0        0         0        0         0        0
                                             168   107520    .0     2000       11      2000       11      2000       11
CHIRIACO SUMMIT                      97C      72    46080    .5    16031      222     16191      224     18069      251
PLASTER CITY                        196B      69    44160   1.0    15709      227     16024      232     19945      287
MAMMOTH                             193A      15     9600   1.0    15132     1009     15443     1029     19221     1281
STODDARD VALLEY                      36B      81    51840   1.0    88347     1090     90122     1112    112173     1384
GLAMIS/IMPERIAL/BUTTERCUP VALLEY    193C     211   135040   1.0   516078     2445    526449     2495    655261     3105
     TOTALS                                 1413   904320        1273205    28711   1295720    29060   1573192    33222
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APPENDIX 7 a (i)

Derivation of total number of Visitor Use Days (VUDs) spent by recreationists on BLM lands in the CDCA in 1977.

Assume 22,000,000 = 1977 Calif. population

x .35* = % Cal. pop. recreating in CDCA

7,700,000 = Total # Calif. recreating in CDCA

x .28* = % Cal. pop. recreating on BLM land

2,156,000 = Total Cal. pop. recreating on BLM Land

x .15+ = assumed out of state visitors are 15% of California recreation use

323,400

+2,156,000

2,479,400 = Total # recreationists on BLM land

The median number of days spent by Californians recreating in the California desert is 3.1 days. For the purposes of this analysis, this value is assumed to be a full day, i.e., a 24 hour period. Since the VUD is a 12 hour period, the median recreation time is 6.2 VUDs. This value is conservative because the Field survey did not sample the long-term recreating "Snowbirds", and because it assumes all use takes only 12 hours (thus assuming overnight visitors constitute a very small proportion of total users). By multiplying the total number of BLM recreationists by the median recreation time spent in 1977 in VUDs, the total number of VUDs for BLM lands is obtained:

2,479,400
x 6.2
15,372,280 VUDs spent recreating on BLM Lands in the CDCA in 1977

* Field, 1977
+ DPS files

APPENDIX 7 a (ii)

VISITOR USE (million visitor use days)

	1978	1980	1990	2000
high	15.4	16.9	25.1	40.8
low		15.7	17.6	19.4

Highest is rate of increase projected on the basis growing affluence, more technological developments, better management of desert resources, and new desert attractions (from SRI, Oct. 1978, p. VI - 2)

Low estimate is based on rate of population growth projected for the Southern California Metropolitan region. (SRI, Oct. 1978, p. II - ii)

APPENDIX 7b (i)

ESTIMATED CALIFORNIA RETAIL SALES OF OFF-HIGHWAY AND DUAL PURPOSE MOTORCYCLES

	Off-Highway Motorcycles	Dual Purpose Motorcycles	Total Off-Highway and Dual Purpose
1973	39,300	48,600	87,900
1974	30,600	37,900	68,500
1975	37,500	22,900	60,400
1976	40,800	34,900	75,700
1977	45,800	25,700	71,500
1978	47,400	15,400	62,800
1979	42,000	20,000	62,000

Source: Estimated by the Motorcycle Industry Council from data compiled by the MIC Manufacturers Shipment Reporting System.

Appendix 7c (i)

ECONOMIC STUDY - CATTLE SALES FROM RANCH RECORDS
1975 THRU 1978

RANCH	AVERAGE POUNDS PER AUM	ALLOTTED AUM's	POUNDS SOLD BY YEAR 1975	1976	1977	1978	TOTAL POUNDS	AVERAGE PER YEAR
1	32.70	2,877	73,700	119,200	73,525	110,000	376,425	94,106
2	31.09	13,128	387,910	408,760	425,520		1,272,190	407,396
3	29.19	1,200	28,005	30,540	33,103	48,475	140,123	35,030
4	44.06	12,168	396,500	397,800	614,150		1,608,450	536,150
5	20.06	821	0	11,771	22,100		33,871	16,935
		30,194						1,089,617

POUNDS PER AUM.......1,089,617 ÷ 30,194............EQUALS.................36.08

Appendix 7c (ii)

CALIFORNIA DESERT CONSERVATION AREA
BLM RESOURCE AREAS, ACRES, ANIMAL UNIT MONTHS, CATTLE EQUIVALENT, VALUE OF GRAZING FEES - 1978

RESOURCE AREAS	SOUTHERN PACIFIC RAILROAD ACRES	ACRES LEASED	AUM ALLOTMENT	NUMBER HEAD CATTLE EQUIVALENT	FEES *
El Centro			7,102	591.8	$10,724.02
Inido		19,409	1,308	109.0	1,975.08
Cima	120,632	1,729,470	48,131	4,010.9	72,677,31
Barstow		843,112	17,854	1,487.8	25,959.54
Ridgecrest		1,253,440	74,870	6,239.1	113,053.70
Bishop		258,240	6,509	542.4	9,828.59
	120,632	4,103,671	155,774	12,981.0	$235,218.74

*AUM's X $1.51

Prepared by Chet Perry - Farm Advisor
Cooperative Extension, San Bernardino

Appendix No. 7c (iii)

SAMPLE COST ANALYSIS OF GRAZING BEEF CATTLE ON PUBLIC LANDS IN THE EAST MOJAVE DESERT - NOVEMBER 1978

SIZE OF OPERATION	NUMBER OF ANIMALS	ANIMAL UNIT MONTHS
Ranch 1	1,100	13,200
Ranch 2	100	1,200
Ranch 3	250	3,000
TOTAL	1,450	17,400

OPERATING EXPENSE ITEMS	SIZE OF RANCH/ NUMBER OF HEAD		
	1,100	100	250
Water	$3,000	$2,700	$5,609
Feed	4,000	4,800	1,622
Hired Labor	10,000	600	0
Maintenance	3,000	100	1,868
Transportation	6,000	4,000	3,991
Pasture Rental	20,000	250	6,144
Interest on Capital	20,000	0	186
Taxes	2,000	1,000	1,362
Veterinary	500	25	25
Electricity	3,000	250	657
Legal Fees	200	325	291
General Overhead	3,000	2,250	7,118
	$74,700	$16,300	$28,773

TOTAL COSTS	$119,773
COST PER AUM $119,773 - 17,400............EQUALS..................	$6.88
INTEREST ON INVESTMENT*	$2.00
TOTAL COST PER AUM	$8.88
COST PER UNIT PER YEAR $8.88 X 12............EQUALS..................	$106.56

*Interest on investment equals one half the market value of permit multiplied by 8% annual interest....Market value determined to be $50.00 per AUM. ($25.00 X 8% = $2.00)

Prepared by Jack Davidson & Chet Perry, Farm Advisors
Cooperative Extension, San Bernardino

Appendix 7c (iv)

Costs Of Grazing Beef Cattle On Public Permits In Inyo & Mono Counties

February 1978
Prepared By P. Dean Smith, Farm Advisor For
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Fees charged for grazing on public lands have been and are being re-evaluated by the U.S. Forest Service and Bureau of Land Managment, in order to arrive at equitable fee schedules. The animal month (AUM) fee is just one part of the cost of operation for the livestock permittee; so studies are being made to identify the other costs with the hope that this information can be used and will be taken into consideration to arrive at fair grazing fee structures.

Ranchers grazing the Inyo and Toiyabe national Forests and adjacent Bureau of Land Management lands were asked to provide information about their permits from which it was possible to calculate costs. Information requested was 1) number of months and cows on permit; 2) grazing fee; 3) veterinary medicine costs; 4) mortality; 5) cost of salt; 6) taxes; 7) man days required to move on and off permit and for management while on the permit; 8) livestock trucking costs; 9) transportation, food, housing, etc. costs.

Summary
Total Cost Per Animal Month (AUM)

	Low	Average	High
Cash Cost	$ 4.03	$ 6.53	$ 10.58
Add Interest on Investment*	2.00	2.00	2.00
Total	$ 6.03	$ 8.53	$ 12.50

*Interest on investment equals one half the market value of permit multiplied by 8% annual interest. An arbitrary market value figure of $50 per AUM was used ($25 X 8% = $2.00). This is a common procedure used by farm management specialists to calculate annual interest on investment in cost studies.

Permits With Cost Per AUM of:

Cash Cost	Total Cost	Number of Permits
$4 to $5	$6 to $7	4
$5 to $6	$7 to $8	5
$6 to $7	$8 to $9	5
- 6.11 mode*	- 8.11 mode*	
- 6.53 mean*	- 8.53 mean*	
$7 to $8	$9 to $10	0
$8 to $9	$10 to $11	3
$9 to $10	$11 to $12	1
Over $10	Over $12	1
		Total Permits..19 (16 USFS; 3 BLM)

*Mode is the middle figure when the costs are arranged in descending or ascending order. Mean is the arithmetical average of the costs.

	Low	Average	High
Months on Permit	1	3.2	7
Cows On Permit	40	231	746
$/AUM:			
Grazing Fee	1.51	1.65	2.10
Veterinary Medicine	.06	.14	.26
Mortality Cost	.03	.30	.50
Moving On & Off Permit (trucking &/Or herding)	.21	1.55	2.61
Care on Permit (management, repairs, maintenance, transportation, etc.)	.81	2.49	5.39
Salt	.04	.10	.51
Head Day Tax	.15	.15	.15
Possessory Interest Tax	.20	.28	.28
Interest on Investment	2.00	2.00	2.00

It is significant that there is a wide cost range in this study. The reasons are clear if one is familiar with the permit and the way it is operated.

The two largest cost variations are those incurred in moving on and off the permit and care and management while grazing the permit. These are affected by:

Length of Stay on Permit. Per AUM cost becomes less 1) the longer the stay on the permit, and 2) the larger the number of AU's on the permit, because this cost can be spread over a larger number of months and AU's.

Distance & Access To Permit. Costs per AUM becomes less, the closer the home ranch is to permit. Trucking, transportation, herding and management costs are less.

Some ranchers must truck their cattle to a trail head; then they must herd them some distance over rough terrain. Others herd them long distances and/or over rough terrain. Those ranchers who do not have easy access or must go long distances use more time and transportation to reach their permits on each trip.

Time Spent in Care & Management. The less time spent the lower the cost per AUM. Some ranchers spend considerably more days on their permits during the grazing season than others.

In summary, AUM costs are affected by:
- distance to the permit.
- # of cows on the permit.
- time spent on care and management.
- # of months livestock is on the grazing permit.

APPENDIX 7d(i)

Future Power Projects

1. Intermountain Power Project - Utah to S. California (IPP) 500 kv line
2. Allen/Warner Valley - 500 kv line (Nevada to L.A.)
3. Palo Verde/Devers - 500 kv line (Phoenix to Devers Substation)
4. Lucerne Valley Combined Cycle - Power Plant & transmission line
5. Palo Verde to Miguel - (Phoenix to San Diego) 500 kv line

Cost Assumptions
1. Powerline = $1/2 million per mile
2. Powerplant = 1500 mw = $3 billion

APPENDIX 7d(iii)

Areas of Wind Generating Stations (mi^2)
(Includes both BLM and private land within multiple use classes)

Station #	Use	Balanced	Protection
1	23.6	23.6	---
2	15.2	---	---
3	4.7	---	---
4	7.3	7.3	2.5
5	4.4	---	---
6	2.9	---	---
7	9.5	9.5	---
8	20.5	---	---
9	2.0	---	---
10	11.6	11.6	11.6
11	5.8	2.3	5.8
12	3.6	---	---
13	1.4	---	---
14	__	2.2	---
15	2.3	---	---
16	13.4	---	---
17	1.12	0.73	---
Total Area	120	57.2	19.9

Total area within MUC having high wind potential = 209

APPENDIX 7d(iv)

Areas of KGRA's (mi^2)

KGRA	Use	Balanced	Protection
Saline Valley	5.41	---	---
Coso	172.--	50.2	
Randsburg-Spangler Hills	25.--	14.1	
Glamis	30.5	27.8	19.5
Dunes	11.7	6.0	1.3
East Mesa	58.4	58.4	20.5
Total Area	303	156.5	41.3

APPENDIX 7 e (i)

Estimated Value of Significant Mineral Commodities located in CDCA

Minerals Element -- Economics

Sixteen commodities were selected for economic analysis of the Minerals Element of the Desert Plan. Three criteria for selection were used: 1) supply and demand trends indicate the commodity will become increasingly important to the national or local economy; 2) the United States imports over 50 percent of the domestic needs for the economy; and 3) economic or potentially economic deposits of the commodity occur in the CDCA. Values are based on average 1978 prices. Discussion centers around the multiple use class into which deposits fall. See discussion of Guidelines for allowable mining practices.

Only major deposits were considered. Smaller mines and deposits were not included. In view of this and the potential for undiscovered resources, the total value of the energy and minerals found on BLM administered lands in the CDCA is potentially much greater than the $77 billion estimate used in this analysis. Moreover, the values cited are in-place values. This analysis does not consider value added for transportation, refining, processing or fabrication, or costs of extraction. Nor does this analysis consider secondary economic impacts due to linkage with other sectors of the economy.

Tungsten

California produces approximately two thirds of U.S. production of Tungsten. Future demand for tungsten is expected to be strong, accommpanied by increases in price. This is due to anticipated expanding uses in the machine tool, construction and mining machinery industries. (SRI International October 1978) Total value is estimated at $19.2 million for BLM-administered lands and $19.5 million for the CDCA as a whole. Variations in totals in the following table are due to proposed land tenure adjustments. In all alternatives, 88 percent of the major tungsten deposits on BLM administered land would fall into Multiple Use Class I. Therefore, economic impacts of the Plan are expected to be minor. Values are given in millions of dollars in all of the following tables.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	0	$1.1	$1.1	$17	$19.2
Protection	$1.0	1.28	0	17	19.28
Use	0	65	1.64	17	19.29
No Action	0	.89	1.3	17	19.19

Borates

The bulk of the world's production of borates are mined in the CDCA at Boron, Searles Lake and the Death Valley area. Borates are used in the manufacture of various glasses, fire retardants, fuels, chemicals, soaps, herbicides and nuclear applications. Demand is expected to increase moderately through the year 2000. Total value is estimated at $11 billion for BLM administered lands and $23.56 billion for the CDCA as a whole. Under the Protection Alternative, 17% of the major deposits would fall into Classes C and L. Mining activities are severely restricted in these two classes. The marginal impact of these restrictions is not known at this time.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$25.5	$25.5	$1800.0	$9,150	$11,001.0
Protection	51.8	1,850.0	0	9,160	11,061.8
Use	0	25.9	1,880	9,160	11,065.9
No Action	0	0	2,100	8,950	11,050

Sand and Gravel

Sand and gravel are major construction materials. Demand is expected to increase annually by 2.8% in the United States. because most of the sand and gravel produced in the CDCA is used in the construction business in southern California, the future of this product is a function of this area's growth, which is expected to be slower than in the recent past. BLM administered lands account for approximately 77 percent of total value of in place sand and gravel deposits in the CDCA.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$2.61	$193	$211	$12.7	$419.31
Protection	41.8	1,020	10	9.82	1,081.62
Use	0	18.8	811	154	983.8
No Action	0	187	651	67.8	905.8

Limestone

The major uses of limestone are the production of various cements and lime products. Limestone used for chemicals, agriculture, soil stabilization and production of carbon dioxide. Current consumption is expected to increase at a rate of 2 to 3 percent nation wide and 3 to 5 percent in southern California. The value of major limestone deposits on BLM administered lands is estimated at $6.3 billion and $9.24 billion for the CDCA as a whole.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$96.0	$2,980	$3,170	$135	$6,381
Protection	1,560	4,810	25.5	0	6,395.5
Use	0	856	5,480	123	6,459
No Action	0	3,190	2,650	420	6,260

Strontium

The major use of strontium is in the manufacture of color television tubes; other uses are pyrotechnics, signals, and permanent magnets. Consumption is expected to increase at an annual rate of 3% through 1985. The United States currently imports all of its strontium needs. Total value of strontium deposits on BLM-administered lands are currently estimated at about $1 billion.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$.21	306	377	360	1,043.21
Protection	244	602	0	184	1,030
Use	0	37.5	189	817	1,043.5
No Action	0	16.2	680	348	1,044.2

Rare Earths

Rare earth oxides are used in petroleum refining, steel and iron production, ceramics, glass, carbon arc electrodes, lighter flints and other uses. The demand for these elements is expected to increase at a 5 percent annual growth rate. The value of deposits on BLM administered lands is estimated at $11.4 billion.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	0	$5,520	$5,520	0	11,040
Protection	0	9,120	0	2,280	11,400
Use	0	2,280	9,120	0	11,400
No Action	0	0	9,120	2,280	11,400

Oil and Gas

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	9.9	160	152	14.9	336.8
Protection	11.6	428	0	16.2	455.8
Use	5	26.1	287	120	433.1
No Action	0	266	149	41.5	456.5

Uranium

The major uses of uraniums are in nuclear power plants, with some use in weapons and weapons research. Depleted uranium is used for containers for radioactive waste, radiation shielding, counter weights and research. It is expected that the U.S. will consume 30,000 tons of uranium by 1985 and in excess of 100,000 tons by 2000 for energy and other related purposes. The value of uranium deposits on BLM administered lands is estimated at $5 billion and $6.6 for the CDCA as a whole.

Alternatitve	Class C	Class L	Class M	Class I	Total
Balanced	0	460	5,280	0	5,740
Protection	200	5,560	0	0	5,760
Use	0	100	3,900	0	4,000
No Action	0	280	4,800	20	5,100

Zeolites

The principal uses for zeolites are for molecular sleves and ion exchange. Molecular sleves are used primarily in sewer treatment facilities. The demand for zeolite is expected to increase at a dramatic rate in the next ten to twenty years. The value of zeolite deposits on BLM-administered land is currently estimated to be $6.96 billion.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$ 840	$1,160	$4,960	0	$6,960
Protection	1,680	3,620	300	0	5,600
Use	0	1,010	4,250	0	5,260
No Action	0	281	6,680	0	6,961

Molybdenum

Molybdenum is an important additive used extensively by the iron and steel industry and increasing in value in other applications. A small amount of molybdenum is recovered as a by-product of tungsten ore in Cuyd County. Demand is expected to rise relatively rapidly in the coming years, increasing annually by 4.3% in the United States (SRI International October 1978) The value of molybdenum deposits on BLM-administered land is estimated at $14.4 billion.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$3,950	$10,400	0	0	$14,350
Protection	11,900	2,470	0	0	14,370
Use	0	0	14,300	0	14,370
No Action	3,950	10,400	0	0	14,350

Thorium

The principal uses for thorium are in electronics, chemicals, refractones and research. The demand for thorium is expected to increase at a rate of 1 percent per year until 1985. The value of thorium deposits on BLM-administered land is estimated at $11.6 billion and $23.9 billion for the CDCA as a whole.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	0	$8,450	$1,580	$1,580	$11,610
Protection	2,640	7,390	0	1,580	11,610
Use	0	5,280	4,750	1,580	11,610
No Action	0	8,440	3,170	0	11,610

Geothermal

The values given below represent government royalties rather than market value of known geothermal areas thought to be capable of producing electricity. Power plants are approved or under construction in five areas in the desert. The Randsburg and Coso areas are being evaluated for power plants. The future potential for geothermal or electricity generation in the CDCA is considered excellent.

Alternatitve	Class C	Class L	Class M	Class I	Total
Balanced	0	$.535	$2.4	$.27	$3.205
Protection	$.336	1.96	.9	.27	3.466
Use	0	0	0	3.2	3.2
No Action	0	.2	3	0	3,21

Copper

The demand for copper in the U. S. has increased steadily over the past 10 years and is expected to increase at a 3.4 percent annual rate between 1973 and 2000. The world market for copper is currently depressed, because of large reserves of mined copper and increasing production. In the short run, production in the CDCA is expected to continue its decline, although production should stabilize and possibly even incresae in the long run, if world shortages occur. (SRI International, October 1978) The value of copper deposits on BLM-administered lands is estimated at $95 million.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$75.4	$3.43	$16.1	0	$94.93
Protection	78.7	16.3	0	0	95.0
Use	62.8	9.42	22.7	0	94.92
No Action	0	79	15.7	0	94.7

Iron

The demand in 1985 for iron ore is expected to be 206 million tons and 285 million tons by 2000. The U.S. mined 81 million tons of Iron Ore in 1978. (Minerals Yearbook, U.S. Bur. Mines 1979) The value of iron deposits on BLM administered lands is estimated at $2.3 billion.

Alternative	Class C	Class L	Class M	Class I	total
Balanced	$319	$913	$878	$236	$2,346
Protection	1,200	783	362	0	2,345
Use	69.3	248	1,880	50.5	2,247.8
No Action	0	593	787	946	2,276

Lithium

The major use of lithium is in glass, aluminum , ceramics, lubrication, batteries and is the only known source of tritium required for power generation in nuclear fusion plants. Overall demand is expected to increase at a rate of 4-5% to 1985. The value of lithium deposits on BLM-administered lands is estimated at $2.7

billion and $30 billion for the CDCA as a whole.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$310	$82.8	$1,020	$1,650	$3,062.8
Protection	490	866	254	1,460	3,070
Use	242	103	961	2,100	3,406
No Action	0	82.8	890	1,760	2,732.8

Clays

Clays are used for ceramics, drill mud, iron production cosmetics, and steel casting. The average growth rate of demand is expected to be 5.7 percent per year to the year 2000. The value of clay deposits on BLM-administered lands is estimated at $3 billion.

Alternative	Class C	Class L	Class M	Class I	Total
Balanced	$5.2	$1,400	$1,620	$56.5	$3,081.7
Protection	28.3	2,360	572	0	2,960.3
Use	0	1,330	1,600	16.9	2,946.9
No Action	0	79	3,010	0	3,089

The following four tables describe these mineral values as they are arrayed by the multiple use classification for each of the four alternatives.

APPENDIX 7e(i) (cont.)

($ Millions)

NO ACTION ALTERNATIVE

	C	L	M	I	Total
Tungsten	0	.89	1.3	17	19.19
Borates	0	0	2,100	8,950	11,050
Sand & Gravel	0	187	651	67.8	905.8
Limestone	0	3,190	2,650	420	6,260
Strontium	0	16.2	680	348	1,044.2
Rare Earth	0	0	9,120	2,280	11,400
Oil & Gas	0	226	149	41.5	456.5
Uranium	0	280	4,800	20	5,100
Thorium	0	8,440	3,170	0	11,610
Tin	0	0	.302	0	.302
Geothermal	0	.210	3	0	3.21
Zeolites	0	281	6,680	0	6,961
Molybdenum	0	3,950	10,400	0	14,350
Copper	0	79	15.7	0	94.7
Iron	0	543	787	946	2,276
Lithium	0	82.8	890	1,760	2,732.8
Clays	0	79	3,010	0	3,089
	0	17,395.1	45,107.302	14,850.3	77,352.702

($ Millions)

PROTECTION ALTERNATIVE

	C	L	M	I	Total
Tungsten	1.0	1.28	0	17	19.28
Borates	51.8	1,850	0	9,160	11,061.8
Sand & Gravel	41.8	1,020	10	9.82	1,081.62
Limestone	1,560	4,810	26.5	0	6,395.5
Strontium	244	602	--	184	1,030
Rare Earth	0	9,120	0	2,280	11,400
Oil & Gas	11.6	428	0	16.2	455.8
Uranium	200	5,560	0	0	5,760
Thorium	2,640	7,390	0	1,580	11,610
Tin	0	.302	0	0	.302
Geothermal	.336	1.96	.9	.27	3.466
Zeolites	1,680	3,620	300	0	5,600
Molybdenum	11,900	2,470	0	0	14,370
Copper	78.7	16.3	0	0	95.0
Iron	1,200	783	362	0	2,345
Lithium	490	866	265	1,460	3,070
Clays	28.3	2,360	572	0	2,960.3
	20,127.536	40,898.842	1,513.5	14,707.29	77,258.068

APPENDIX 7e(i) (cont.)

($ Millions)

BALANCED ALTERNATIVE

	C	L	M	I	Total
Tungsten	0	1.1	1.1	17	19.2
Borates	25.5	25.5	1,800.0	9,150	11,001
Sand & Gravel	2.61	193	211	12.7	419.31
Limestone	96.0	2,980	3,170	135	6,381
Strontium	.21	306	377	360	1,043.21
Rare Earth	0	5,520	5,520	0	11,040
Oil & Gas	9.9	160	152	14.9	336.8
Uranium	0	460	5,280	0	5,740
Thorium	0	8,450	1,580	1,580	11,610
Tin	0	.03	.273	0	.303
Geothermal*	0	.535	2.4	.27	3.205
Zeolites	840	1,160	4,960	0	6,960
Molybdenum	3,950	10,400	0	0	14,350
Copper	75.4	3.43	16.1	0	94.93
Iron	319	913	878	236	2,346
Lithium	310	82.8	1,020	1,650	3,062.8
Clays	5.2	1,400	1,620	56.5	3,081.7
	5,633.82	32,055.4	26,587.9	13,212.37	77,489.458

* Government royalties

USE ALTERNATIVE

	C	L	M	I	Total
Tungsten	0	.65	1.64	17	19.29
Borates	0	25.9	1,880	9,160	11,065.9
Sand & Gravel	0	18.8	811	154	983.8
Limestone	0	856	5,480	123	6,459
Strontium	0	37.5	189	817	1,043.5
Rare Earth	0	2,280	9,120	0	11,400
Oil & Gas	5	26.1	287	120	433.1
Uranium	0	100	3,900	0	4,000
Thorium	0	5,280	4,750	1,580	11,610
Tin	0	.302	0	0	.302
Geothermal	0	0	0	3.2	3.2
Zeolites	0	1,010	4,250	0	5,260
Molybdenum	0	0	14,300	0	14,300
Copper	62.8	9.42	22.7	0	94.92
Iron	69.3	248	1,880	50.5	2,247.8
Lithium	242	103	961	2,100	3,406
Clays	0	1,330	1,600	16.9	2,946.9
	374.1	11,325.672	49,432.34	14,141.6	75,273.712

APPENDIX 7e (ii)

Geothermal Energy Production Potential in the CDCA

Geothermal: 1978 average value = $5,000 per megawatt of generating capacity to a county in taxes -- Imperial County Geothermal Element, 1978. Generating capability taken from U.S. Geological Survey Circular No.760 - 1979.

To generate electricity, a minimum temperature of 160°C is required. Only KGRAs exceeding this temperature limit can have dollar values, on a yearly basis, calculated for them. The other KGRAs having less than 160°C have values for direct heat applications but at present only a BTU and not a dollar vallue can be assigned to them.

The East Mesa, Heber, Brawley, Salton Sea, and Westmoreland areas have power plants approved for them or actually under construction at present.

The Randsburg and Coso areas will be receiving evaluations for power plants in the very near future.

The Saline Valley, Ford Dry Lake, Glamis, and Dunes KGRAs are presently unexplored and may become generating centers in the future if exploration proves a >160°C temperature at depth.

Future potential for geothermal energy generation in the CDCA is considered to be excellent.

							Land	
Geothermal Area	Temp °C	Volume Km^3	Heat Content BTUx10^{14}	Extractable Heat BTUx10^{14}	Electrical Generation Capacity for 30 years in MWe	Tax Value of Power Generation Based on \$5000/MW/ Yr in \$x10^6	BLM	Priv.
Coso Hot Spring KGRA	220	12.0	237.0	14.69	650	3.25	51,760	
Randsburg KGRA	172	10.0	37.92	1.89	84	0.42	12,880	
Salton Sea KGRA	323	34.0	919.56	76.79	3400	17.0		95,824
Heber KGRA	175	71.0	293.88	14.69	650	3.25		58,568
Brawley KGRA	253	34.0	208.56	14.31	640	3.20		28,885
East Mesa KGRA	182	36.0	154.52	8.06	360	1.80	38,365	
Westmoreland	217	123.0	635.16	37.92	1710	8.55		41,000
Glamis KGRA	132	5.0	14.88		0.89		25,505	
East Brawley	132	3.3	9.95	0.60			10,000±	36,080
Dunes KGRA	132	8.9	26.54	1.59			7,680	
Saline Valley KGRA	89	3.3	6.26	0.38			3,200	
Tecopa Hot Springs	126	3.3	9.48	0.57			69,120	
Ford Dry Lake KGRA							7,680	
					BLM = \$5.47x10^6	PVT = 320x10^6		

APPENDIX 7e (iii)

Geothermal Districts in the CDCA

East Mesa Geothermal

The East Mesa Geothermal District (Fig. 1) consists of two known and two suspected geothermal reservoirs on Federally controlled lands in Imperial County California. The reservoirs are fault controlled, being localized by the intersections of two or more faults. These intersections provide the ground water with a plumbing system for descending the list rocks at depth and for rising back up into the ground water reservoirs.

Over 8000 feet of the unconsolidated sands and silts of the Colorado Delta form the reservoir rocks for the geothermal district. The hot waters localized in a horizontal unit beginning at 5500 feet below surface and extending down to 7500 feet. Block faulting within the District prevents extensive lateral migration of the hot waters, thereby forming the localized reservoirs. An impervious clay cap that is 600 feet thick, beginning at a depth of 1200 feet, prevents the upward migration of the hot waters to the surface and contains the reservoir in place

The East Mesa KGRA has been rated at being able to generate up to 360 Megawatts (MWe) of electric power if fully developed. The exact size of the reservoir has not been delineated and the output could be larger. Two power plants are in progress on the KGRA, a 10 MWe and a 48 MWe unit.

The East Brawley field is being developed along Hwy 78 on the private lands. Recent geophysical data indicate that it extends under the District along Hwy 78 as well. It has not been rated for MWe as yet.

The West Glamis field is inferred from high heat flow values of 20-30 degrees F/100 feet over a large area. Actual drilling to test the anomaly has not yet taken place. As yet no leases have been issued.

The Dunes KGRA was drilled in 1972 and 170 degrees F water was encountered over a narrow interval at 1800 feet below surface. The reservoir is still essentially untested, as the anomaly extend eastwards under the Imperial Sand Dunes and has not as yet been leased.

The Glamis - Dunes Geothermal District

This District consists of the East Glamis field and Ogilby anomalies. Heat flow data yield value of 15-30 degrees F/100 feet has been measured in some places. No drilling has taken place due to lack of issued leases. The potential is considered high for geothermal development.

The Yuha Basin Geothermal District

This area consists of two potential reservoirs, the Mt. Signal and Yuha Buttes anomalies. Heat flow values are 15-30 degrees F/100 feet and the potential is considered high. The anomalies are fault controlled and lie along the Jaguna Salada Fault which is the extension of the Cerro Prieto Fault in Mexico. This fault hosts the Cerro Prieto geothermal reservoir, which is currently generating 150 MWe of electrical power.

The Southwest Salton Sea District

The District contains the San Felipe Wash and McCain Spring anomalies. It is considered to be a geologic extension of the adjacent Westmoreland Reservoir. The Westmoreland Reservoir has been rated at being able to produce 1710 MWe at full development. The two anomalies have not been drilled due to lack of lease issuance, but their potential is considered excellent.

North Salton Sea Geothermal District

This District lies along the San Andreas Fault and contains several hot springs along the north east side of the District. Several dry wells have been drilled in the area to date, but the central anomaly has not been tested yet. The area is completely leased and exploration is still continuing. Potential is considered moderate on the basis of present data.

The Randsburg District

This District covers the Red Mountain - Alvord Mountain area of San Bernardino County. One steam well currently exists on private land in the KGRA. The area has good potential for both hot water and steam resources due to multiple faults and Mid-tertiary volcanic rocks. Numerous hot spring deposits (such as the Trona Pinnacles) are present in the area. The KGRA has been rated as having a generating potential of 84 MWe. This figure is conservative and may enlarge with future exploration activities.

The Pisgah Crater - Amboy Crater - Bristol Mts. District

This District consists of two prospects, Pisgah Crater and the Bristol Mts. - Amboy Crater areas. Activity to date consists of three years of exploration in the area by various companies. A promising anomaly has been located north of Amboy Crater. Pisgah Crater remains untested. The potential of the area is considered moderate to good

The Cosco Hot Springs District

This KGRA and surrounding area lie within a young volcanic terrace of recent activity. The area has excellent potential and has been rated at being able to produce 650 MWe of electrical power with full development.

The Tecopa Hot Springs District

This new area of activity has good potential based on comments from private industry. Drilling has not yet been undertaken but is planned for the near future.

Saline Valley District

The District consists of a KGRA and local environs under Saline Dry Lake. Hot water occurs at temperature of 80 degrees C or less. Potential is moderate but, until drilling proceeds, a full evaluation can not be made.

Ford Dry Lake District

This District consists of the KGRA and local environs centered on the Ford Dry Lake bed. No major activity is taking place at present due to lack of leases being issued. A geophysical anomaly is present under the lake bed and freely circulating hot water (150 degrees F) was discovered under the lake at 500 feet below surface by the U.S. Geological Survey (1978). The potential of the area at present is considered good to moderate.

MWe source: USGS Circular #790, "Assessment of Geothermal Resources of the United States - 1978."

Appendix 7e (iv)

Multiple Use Classification of Geothermal Potential Areas by Alternative

NO ACTION	PROTECTION	BALANCED	USE
Red Mt.-Alvord Mt.			
L	C	L	I&M
1/4I&M,3/4L	1/4M,3/4C&L	1/2M&*,1/2C&L	1/5L,4/5M&I
Saline Valley			
L	C	1/2C, 1/2L	1/3C, 2/3M
Coso			
M&Naval Weapon Center	L	1/2M, 1/2L	M&I
Ford Dry Lake			
M&I	1/4C, 3/4L	2/3M, 1/3L	M&I
North Salton Sea			
Unclassified	disposal	disposal	disposal
SW Salton Sea			
1/4L, 3/4M	L	1/4L, 3/4M	M
East Mesa			
1/4L, 3/4M	1/2M, 1/2L	1/4L, 3/4M	1/4M, 3/4I
Glamis-Dunes			
1/4L,3/4M&I	3/4C&L,1/4I	3/4C&L,1/4I&M	1/4L, 3/4I
Yuha			
1/4I, 3/4L	1/5M&I,4/5L	M&I	M&I
Pisgah Crater			
M	1/2M, 1/2L	M	M
Bristol-Amboy			
M&I	1/10I,9/10C&L	1/10L,9/10M&I	M&I
Tecopa			
M&I	1/5M,4/5C&L	1/2M&I,1/2C&L	1/5C,4/5M&I

APPENDIX 8a

SUMMARY OF ARABLE LANDS INVESTIGATION

Water and Power Resource Service (formally the The Bureau of Reclamation) conducted reconnissance and sub-reconnaissance land classification studies during the period between 1965-1971 within the CDCA. The total arable lands determined through these studies came to approximately 3 million acres.

The major areas where arable lands exists are:

Antelope, Fremont Valleys-approx.	700,000 ac.
Cadiz Valley	60,000
Chemehuevi Valley	60,000
Chuckwalla Valley	80,000
Coachella Valley	90,000
Fenner Valley	110,000
Indian Wells Valley	120,000
Lanfair Valley	100,000
McCoy Wash Valley	95,000
Mojave River Valley	800,000
Morongo, Yucca, 29 Palms Valley	110,000
Shadow Valley	170,000
Ward Valley	160,000
West Mesa Area	80,000
	2,735,000 ac.

In addition to these areas many other smaller basins with arable lands exists. Reports and maps of the land classification and location of these arable lands are located in the Water and Power Resource Service office in Boulder City, Nevada.

APPENDIX 8b

Soil Sensitivity Rating

The different categories of sensitivity are relative ratings and do not reflect suitability for use. Ratings of 1, 2, and 3 will be used, reflecting decreasing sensitivity to the impact of man.

Category 1 (high sensitivity)

Soils on undifferentiated mountains, hills and badlands within this category occur on moderately steep to very steep slopes (15 to >75%) making these soils very susceptible to water erosion if disturbed. Much of the soils are very shallow to shallow (<20") resulting in a major impact on the soil profile with soil loss through erosion.

Soils occurring on dissected fans and highly dissected fans have well-developed vesicular surface crust with textures of very fine sandy loam, loam or silt loam. These surface crusts are usually well protected with desert pavement making it a very stable surface. Impacts to these surfaces break down the surface crust leaving it very susceptible to wind and water erosion. Also the visual impact of the disturbed desert pavement surface would be very long-lasting. These soils usually have a developed "B" horizon which shows an accumulation of clay size particles. These developed "B" horizons indicate soil development during a period of much wetter climatic conditions. Some of these soils have their entire profile of surface and "B" horizons very close to the surface (<10") and could be easily destroyed. These older soils which were formed in the past under different climatic conditions if destroyed would be lost for a very long time. Other soils have sandy loam to clay loam surface textures which are very susceptible to compaction when moist. This high susceptibility to compaction with sloping areas and shallow soils makes it very susceptible to erosion if impacted.

Other areas of high sensitivity to impact would be areas of wind blown sand which have been stabilized. Any disruption of these areas will cause increased mgration of sand. these areas of stabilized sand surfaces would be found in the sand dune and sand covered dry playa land form type which is considered to be a lower sensitivity category.

Areas of high silt or very fine sand content with textures of very fine sandy loam, loamy very fine sand, silt loam or silt are very susceptible to wind and water erosion. These areas are usually found associated with playas edges and are included within the undifferentiated plain landform type.

Category 1 (high sensitivity)

M - Undifferentiated Mountain
Mountains are dominated by local relief in excess of 500 feet (more than 80%), slopes are steep to very steep (30 - >75%) with rugged summits. Rock outcrops are numerous, covering from 10 to

90% of the area. Soils are very shallow to deep (< 10 to 20"). Textures range from sand to silty clay loam.

H - Undifferentiated Hill
Hills are dominated by local relief of less than 500 feet (more than 80%), moderately steep to steep slopes (20-50%) and somewhat rounded outline. Also in the category are erosional remnants and dissected fans with local relief in excess of 100 feet. Rock outcrops could be present, covering from 0 to 80% of the area. Soils are very shallow to deep (< 10-60") but dominately shallow to moderately deep (20-36"). Textures range from sand to silty clay loam.

B - Undifferentiated Badland
Badlands are characterized by a high density of gullies and ravines and intervening "sawtooth" ridges. Slopes are variable ranging from moderately steep to very steep (15 to 75%). Textures range from sand to clay. Vegetation is usually very sparse.

Fd - Dissected Fan
Dissected fans are characterized by a gently to strongly sloping surface (2 to 15%), major vertical topographic irregularities (5-20 ft.) with a frequency of occurrance of 15 to 20 per mile and wide distances between stream channels (50-400 feet). Surfaces are usually covered with desert pavement ranging from gravel to stones with varying degree of patination. Soils found on this land type usually has a well developed surface crust with textures of silt loam to very fine sandy loam. Subsoil usually contains developed "B" horizon of sandy loam to clay loam textures.

Fh - Highly Dissected Fan
Highly dissected fans are characterized by gently to moderately steep slopes (2 to 25%), deeply incised gullies and ravings (15-60 ft.) with moderately steep slopes (20-30%). Frequency of occurrence is 6 to 10 gullies or ravines per mile with varying distances between stream channels (20 to 400 feet). Surfaces are usually covered with desert pavement ranging from gravel to stones with coarse fragments predominantly cobbles and stones. Soils found on this land form may have a well-developed surface crust with textures of silt loam to very fine sandy loam and subsoils of developed "B" horizons of sandy loam to clay loam textures. Other soils found on this landform type have sandy loam or loam surface horizons with cemented horizons within the subsoil. Cementation is usually caused by calcium carbonate or silica accumulations. The depth to cementation varies from very shallow to moderately deep (<10" - 36").

Category 2 (medium sensitivity)

Soils on playas have surface textures of silty clay loam to clay. These surfaces are very resistant to compaction or granulation. Wind erosion would be a problem on these land types because of its open nature. Heavy use on these surfaces does produce particles susceptible to wind erosion. Many areas adjacent to playas contain soils with textures of very fine sandy loam or silt loam which are very susceptible to wind and water erosion.

Soils found on plains have a wide variation of surface textures, silty clay loam to sand. Slopes are level to nearly level (0 to 3%) minimizing the effects of water erosion. Intensity of use, differences of soil textures, and time of use on these areas would be a big factor in determining impacts. Sand covered plains would have a low sensitivity to compaction but would have problems with wind erosion. These are areas with high potential of blowing sand because of the avaiability of sand and sparse vegetation.

Soils on alluvial fans have a wide range of surface textures, ranging from sandy clay loam to coarse sand with varying degree of coarse fragments of gravel, cobbles or stones. This large land form type occurs on gently to moderately sloping surfaces (2 to 8%). Soils with developed "F" horizons or calcium carbonate cementation are also found on this land type but usually the surface horizons are much thicker and the pavement cover with vesicular crust like the soils in category 1 are lacking. The sand covered fans and sand covered dissected fans would have a high sensitivity where the sand cover is very minimal or absent.

Use in these areas should consider surface textures present, textures of sandy loam would be impacted to a greater degree as compared to textures of sand and coarse sand found in river washes or eolean areas. Also intensity of use and time of use are critical elements to be considered. Intensive use will surely impact the soil, increasing water and wind erosion and affecting the vegetation of the area. Use during periods when the soil is moist and highly susceptible to compaction should be avoided.

Soils found on pediment surfaces occurs on slopes of 10 to 20% with surface textures dominately gravelly loamy sand to gravelly sandy loam. Soils on steper slopes within this landform type would be highly susceptible to water erosion. Sand covered pediments would be less susceptible to water erosion but would be susceptible to wind erosion.

Sand covered hills are less susceptible to water erosion because of the sand cover which would be resistant to compaction. Wind erosion could be a problem in these areas.

Soils found on mesas and tilted plateaus are usually medium textured with coarse fragments of gravel, cobbles and stones. These soils could be very susceptible to wind and water erosion but the gentler slopes and surface coarse fragments would decrease its erosion potential.

Category 2 (medium sensitivity)

Pd - Dry Playa
Dry playas are characterized by nearly horizontal surfaces (0-1% slope) which are poorly drained, usually saline and covered with water after floods. Soils are usually fine textured, silty clay loam, silty clay or clay. Vegetation is normally non-existent.

Pm - Moist Playa
Moist playas are areas characterized by horizontal surfaces with salt crusts underlain by a constantly moist layer that fluctuates seasonally and the areal extent of which varies seasonally. Soil textures are usually fine, silty clay loam, silty clay or clay.

F - Undifferentiated Fan
Undifferentiated fans are characterized by gently to moderately sloping surfaces (2 to 8% with side slopes up to 12%), minor vertical topographical irregularities (1 to 3 feet), occurring with a frequency of 30 - 50 per mile and narrow interfluve surfaces (less than 40 feet). This large landform type contains many different kinds of soils. Surface textures range from sandy clay loam to coarse sand with coarse fragment ranging from gravel to stones. Subsoils contain developed "B" horizons, calcium carbonate accumulations or stratified horizons of different textures. Surfaces usually lack the developed pavement formation or well-developed vesicular crusts.

Fds- Sand-covered Dissected Fan
Sand-covered dissected fans are dissected fans covered by a veneer of sand, varying in depth from 1 to 3 feet deep. This land type is usually associated with badlands, hills or highly dissected fans.

Fs- Sand-covered Fan
Sand-covered fans are fans covered by a veneer of sand varying in depth from 1 to 3 feet deep. This landtype is usually associated with sand dunes and sand-covered plains.

P - Undifferentiated Plain
Plains are areas characterized by level to nearly level surfaces (0 -3% slope) with shallow (1 - 6 feet) topographic irregularities. A wide variation of soils can be found on this landform type. Surface textures varies from silty clay loam to sand. This landform type is usually found adjacent to playa areas or areas being cultivated. Areas of highly sensitive soils are found within this landform, these are soils with high silt content found adjacent to playas and are very susceptible to wind and water erosion.

Ps - Sand-covered Plain

Sand-covered plains are plains covered by shifting sands. Depth of sand varies from several inches to several feet. These areas are usually associated with sand dunes and playa areas. Also found in these areas are low sand dunes which may or may not be stabilized. Soils textures below the sand surface varies from silty clay loam to loamy sand.

T - Undifferentiated Pediment
Undifferentiated pediments are characterized by a slightly inclined rock plain (10 -20% slope), residual knobs of bedrock, a thin veneer of alluvium and collurium (1 to 4 feet) thick. Minor to major (3 to 15 feet), moderately steep to steep (10 to 40% slopes) topographic irregularities occur with a frequency of 5 to 20 per mile. Surface textures range from gravelly sand to sandy clay loam.

S - Sand-covered Pediment
Sand-covered pediments are pediments covered by a thin veneer of sand usually 1 to 3 feet thick. This land type is usually associated with sand covered fans.

HS - Sand-covered Hill
Sand-covered hills are characterized by hills with a sand cover of 1 to 5 feet, moderately steep to steep slopes (20 to 50%) and somewhat rounded outline. Some rock outcrops may be present.

Pds- Sand-covered Dry Playa
Sand-covered playas are characterized by wind blown sand occurring on dry playa surfaces. Topography sand occurring on dry playa surfaces. Topography varies from nearly level to small hills or ridges.

Pl - Mesa
Mesas are characterized by cliff-hounded, level to gently sloping surfaces 1 to 5%, often dissected. Surface textures are dominately medium textured but range from loamy sand to clay loam with coarse fragments of gravel, cobbles and stones.

Pt - Tilted Plateau
Tilted plateaus are characterized by a single or series of gently to strongly sloping surfaces (5 to 20%) with intervening very steep to vertical escarpments. Surface textures are dominately medium textured but range from loamy sand to clay loam with coarse fragments of gravel, cobbles and stones.

Category 3 (low sensitivity)

Soils within this category have surface textures of sand or coarse sand. Riverwash areas contain soils with gravelly to stony sand or coarse sand. Surface impact to these areas would be less because of the ability of sand to withstand compactive forces with minimal changes. Although the impact on the soil would be minimal, riverwashes contain a high concentration of vegetation which could be easily impacted. Another concern in these riverwashes would be the banks or escarpments which usually have different soil textures. The sloping banks or escarpments would be very susceptible to erosion and would have a high sensitivity to impact. The areas of predominately active sand dune contain sand or fine sand textures which would have minimal changes to compactive forces. Use in these areas should be evaluated on a long term basis, studying if continual use affect the shape or location of these dunes. Also use should be controlled to minimize blowing sand during periods of high winds.

Category 3 (low sensitivity)

R - Undifferentiated riverwash
Riverwashes are characterized by wide (15 - 40 feet) braided channels, with minor (1 - 4 feet) topographic irregularities occurring 3 to 4 times per hundred feet. Slopes range from nearly level to strongly sloping (0 - 10%). Surface textures are usually gravelly to stony sand or coarse sand.

S - Undifferentiated Dune
Dunes are characterized by a cover of wind blown sand. Topography varies from nearly level to hills or ridges formed by the wind. Sand in these areas are predominately active, but the main body of sand does not appear to be advancing.

Sb - Barchan Dune
Barchans are sand hills, crescentic in plan, with a gentle windward slope (15 - 20%) and a steep slipface (34 - 40%), with or without contact between adjacent dunes.

Sc - Crescentic Dune
Crescentic dunes are sand ridges composed of segments, each of which is crescentic with its length equal to or nearly equal to its width (50 - 200 feet). The crescentic segments are aligned in symmetrical wavy ridges with a frequency of occurrence of 15 to 30 per mile.

Sl - Longitudinal Dune
Longitudinal dunes are characterized by longitudinal ridges with a length several times greater than their width (40 - 80 feet), commonly with a slipface on one side. Frequency of occurrence varies from 8-20 ridges per mile.

L - Undifferentiated Lava Flow
Lava flows are characterized by rough, rubbly and hummocky, gently sloping surfaces (1 to 5%) which are occasionally cliff bounded.

Not considered in sensitivity categories:

Pc - Cultivated Plain
Cultivated plains are cultivated flood plains and depositional basins characterized by man-induced topographic irregularities.

CALIFORNIA DESERT

LANDFORM CLASSIFICATION

PLAYAS:

Pd	Dry Play
Pds	Sand-covered Dry Playa
Pm	Moist Playa

PLAINS:

P	Undifferentiated Plain
Pc	Cultivated Plain
Ps	Sand-covered Plain

RIVERWASHES:

R	Undifferentiated Riverwash

SAND DUNES:

S	Undifferentiated Dune
Sb	Barchan Dune
Sc	Crescentic Dune
Sl	Longitudinal Dune

ALLUVIAL FANS:

F	Undifferentiated Fan
Fd	Dissected Fan
Fds	Sand-covered Dissected Fan
Fh	Highly Dissected Fan
Fs	Sand-covered Fan

PEDIMENTS:

T	Undifferentiated Pediment
Ts	Sand-covered Pediment

HILLS

H	Undifferentiated Hill
Hs	Sand-covered Hill

BADLANDS:

B	Undifferentiated Badland

PLATEAUS:

Pl	Mesa
Pt	Tilted Plateau

MOUNTAINS:

M	Undifferentiated Mountain

LAVA FLOWS:

L	Undifferentiated Lava Flow
O	Volcanic Cone

APPENDIX 8c

Impact of Livestock Grazing on Soil

Grazing impacts the vegetation, soil and wildlife resources within an area. The changes to these resources are not fully understood at this time and especially the interaction of these changes as it affects erosion and sediment yield. Vegetation cover in the desert is low and may not be appreciably changed even by heavy grazing (species composition may be altered without causing a significant change in cover). Therefore predictions of changes in vegetative cover which might be related to changes in potential for erosion are difficult. BLM studies have shown that grazing causes severe soil compaction in limited areas such as watering sites, holding areas and intensively used trails. The majority of grazed areas have little soil compaction in comparison to undisturbed locations. The changes in soil due to grazing and its interaction with processes of detachment, transportation and sedimentation over a large area such as these grazing allotments are not fully understood. Movement of cattle over areas with vesicular crusts may cause an increase in infiltration rate by loosening the dense surface layer. This could reduce runoff and erosion during an intense rainfall. Also high use by cattle in an area may cause increased compaction reducing infiltration rates. This could increase runoff and erosion during an intense rainfall. Any calculation of increased erosion with increased grazing is questionable since it is yet not estalished whether or not a net decrease or increase in runoff and water erosion will actually occur. The interaction of wildlife to grazing and its effect on erosion and sediment yield is not understood at this time. Areas of intensive use such as watering areas and holding areas show very high impact. These areas have very high mechanical impedence values and complete loss of vegetation.

Allotment No. 47 Lanfair Valley - 700-800 psi (holding area)
Allotment No. 17 Horse Canyon - 400-700 psi (watering area)

Mechanical impedence values of 300 psi have shown to greatly restrict root growth of cotton and corn (Grimes et. al., 1975) and alfalfa (Grimes et. al., 1978).

Other areas of high impact because of grazing occurs in well defined trails which usually radiate out of the intensively used areas. There trails also show high mechanical impedence values and loss of vegetation.

Allotment No. McCain Valley - 200-350 psi (trails)
Allotment No. 17 Bird Spring - 250-450 psi (trails)
Allotment No. 17 Horse Spring - 400-500 psi (trails)
Allotment No. 47 Lanfair Valley - 200-350 psi (trails)

Impact to the soil decreases as the distance from these concentrated use area increases, except in the trails. A transect was made in Lanfair Valley going from the holding area to approximately

1000 ft. away. All of this area has been intensively grazed over a long period of time.

Allotment No. 47 Holding area - 800 psi (Lanfair Valley)
250 ft. away - 250 psi
400 ft. away - 200 psi
600 ft. away - 150 psi
1000 ft. away - 150 psi

Penetrometer readings were also taken in the California city area where sheep grazing occurs.

Allotment No. 22 Sheep corrals - 350 psi
Sheep grazing areas - 150-200 psi

Studies by (Webb, 1978) has shown high mechanical impedence values in bedding areas where sheep are concentrated.

Problems with wind erosion can occur in areas of concentrated sheep grazing. Movements of flocks of sheep could cause long continuous erosion fetches of loose soil causing emission of large amounts of dust.

Erosion Condition and Trend - East Mojave P.U.

A Phase I watershed inventory was conducted during 1971-72. Erosion condition was determined using soil surface factors such as soil movement, surface litter, surface lock, ped stalling, flow patterns, rills and gullies. Erosion condition classes of stable, slight, moderate, critical and severe were formed by grouping different levels of erosion condition.

A vegetation inventory was conducted during 1975-76 and the information compared with the earlier inventory.

1971 - 72

Barren	Stable	Slight	Moderate	Critical	Severe
6%	2%	24%	53%	15%	4%

Total area - 907,297 ac.

1975 - 76

17%	7%	50%	38%	4%	4%

Total area - 900,449 ac.
Difference in total are because of planning unit boundary change.

Allotments
#40,41,43,44,46,
47,48,49,50 & 53

A large percent of the area was determined to be in a slight to moderate erosion condition - 1971-72 -- 77%, 1975-76 -- 88%. The differences in the barren category were due to the method used in the early survey. The 1971-72 survey grouped much of the upland area in the barren category which was evaluated and found to be in the stable or slight erosion condition class. The major difference is the percentage of area in the category of critical erosion condition 1971-72 - 15% and 1975-76 - 4%. This indicates that there has been a change in erosion condition from 1971-72 to 1975-76 showing a decrease in areas of critical erosion condition.

This improving trend could be due to other factors. The differences between inventories could be partly due to individuals evaluating the various soil surface factors which determine the erosion condition classes.

These watershed areas contain much of the major grazing allotments. Grazing has been occurring for a long time within these watershed areas.

Problems of increasing erosion occurs in areas of steep slopes and concentrated use. Impacted trails on steep slopes could channel water causing rills and gullies to form. Usually animal trails on steep slopes are made following the contour which would minimize the potential for increased erosion.

Sediment Yields

Some attempts at predicting the impact of grazing through models have been made. These models are at a preliminary stage at this time and have been evaluated for climatic conditions differing from our CDCA area. The use of infiltration capacities and cover densities by (Fogel et. al., 1978) in predicting changes in sediment yields has many problems because of the low cover values in the desert and the extension of infiltration data to large areas is not known. Gifford and Hawkins (Hydrologic Impact of Grazing on Infiltration: A Critical Review, 1978) states that the procedure and rationale for the extension of infiltration information for essentially point samples to an entire watershed is not at all clear.

The Pacific Southwest Inter-Agency Committe (PSIAC) method for estimating sedimant yields (1970) should not be used to predict sediment yields values with great accuracy. This method was designed to make general sediment classifications for areas greater than 10 square miles. The projections and interpolations of sediment yield values beyond the scope of this study is not recommended. The use of the PSIAC method for the CDCA is questionable because of the evaluation of this method in wetter climates and the value of ground cover in grazed or ungrazed areas being lower than 20%.

Application of the Universal Soil Loss Equation (USLE) would involve the same uncertainty about the changes in cover as the PSIAC method. The USLE is based on erosion from standard size plots and not applicable to an entire watershed. It does not apply to gully and channel erosion which would be a major component of sediment yield.

Also the changes to the soil by grazing and its effects on the soil erodibility factor (k) is not fully understood. Erosion in much of the grazing areas may result in movement of soils for relatively short distances rather than long distance transport of sediments.

Wind erosion values would be very difficult to determine with the Wind Erosion Equation. The equation was not developed and has not been modified for desert conditions with limited vegetation and very short erosion fetches of disturbed soil, conditions found in grazing areas within the CDCA.

The feasibility of predicting differences in erosion and sediment yield on various allotments within the CDCA due to different levels of grazing is questionable. The complex interrelationship of the many factors such as the effect of grazing on the vegetation and soil, the process of detachment, transportation and deposition of soil particles and the major impact of climatic variability makes predictions of sediment yield due to different levels of grazing very difficult if not impossible.

How can we evaluate the impact of grazing on soil within the CDCA? BLM studies have shown that the areas of high impact (high mechanical impedence values) are limited to such areas as watering sites, holding areas and intensively used trails. Measuring the extent of these high use areas as it relates to intensity of use might be a useful method of evaluating grazing impacts on soil. Also by evaluating older aerial photos a trend evaluation could be made as it relates to time and grazing intensity.

APPENDIX 9a

State and Federal Listed Rare and Endangered Plants Within The CDCA

Federal

Endangered

Oenothera avita ssp. eurekensis
Swallenia alexandrae

Threatened

No plants listed under this category in California at this time.

State

Endangered

Astragalus magdalenae var. *piersonii*
Astragalus lentiginosus var. *sesquimetralis**
Cordylanthus eremicus ssp. *bernardinus*
Croton wigginsii
Eriogonum ericifolium var. *thornei*
Swallenia alexandrae

Rare

Dedeckera eurekensis
Oenothera avita ssp *eurekensis*

* May shortly be listed as "Endangered" by the Federal Government (Joseph Dawhan, Botanist U.S.F. & W.S., Pers. comm.)

APPENDIX 9 b

Proposed Reductions (%) of AUM's (Animal Unit Months) Allocated to Wild Horses and Burros Within Affected Grazing Allotments

PLAN ALTERNATIVE

ALLOTMENT	PROTECTION	BALANCED	USE	NO ACTION
Deep Springs	-42	-54	-50	0
Last Chance	-49	-61	-75	0
Oasis	-30	-58	-60	0
South Oasis	-10	-36	-52	0
Darwin	-91	-91	-95	0
Hunter Mountain	-84	-87	-89	0
Lacey-Cactus-McCloud	-94	-95	-98	0
Tunawee Common	-11	-41	-77	0
Pilot Knob	-100	-100	-100	0
Newberry-Ord	-50	-51	-75	0
Whitewater Cyn.	-68	-70	-70	0
Clark Mountain	-69	-73	-86	0
Colton Hills	-1	-10	-48	0
Granite Mountian	-57	-50	-61	0
Gold Valley	-79	-84	-90	0
Kessler Springs	-13	-14	-46	0
Lanfair Valley	-40	-60	-81	0
Piute Valley	-100	-100	-100	0
Valley View	-60	-74	-84	0
Valley Well	-32	-53	-66	0
Ford Dry Lake	-100	-100	-100	0
Laisy-Daisy	-38	-75	-75	0
Average Reduction	-55	-65	-76	0

APPENDIX 9 c

Summary of Changes in Vegetation Cover Due to Off-road Vehicle Impact on Several Study Areas in the Mojave Desert*

Location of Study Area	Vegetation Type	Area Subdivision	% Change in Veg. Cover
Jawbone Canyon	ChBS[1]	Hillside-Sparse Trails	-35%
	ChBS	Hillside-Dense Trails	-52%
	ChBS	Hillside-Very Dense Trails	-73%
	AlS[2]	Pit Area	-91%
Dove Springs	CBS[3]	Denuded Hillsides	-100%
	ChBS	Part Denuded Hillsides	-64%
Stoddard Valley	CBS	Pit Area	-100%
	CBS	Hillside	-92%
	CBS	Raceway	-99%
	AlS	Pit Area	-98%
Afton Canyon	CBS	Hillside Trails	-77%
	CBS	Pit Area	-98%
Barstow-Vegas Raceway	ChBs	Racecourse	-69%
	CBS	Racecourse	-68%

* Data from Lathrop (1979)

1] Cheesebush (_Hymenoclea salsola_) Scrub

2] Allscale (_Atriplex polycarpa_) Scrub

3] Cresote bush (_Larrea tridentata_) Scrub

APPENDIX 9 d

Summary of Impacts on Vegetation of the 1974 Barstow - Las Vegas Motorcycle Race*

Summary Data

Site Number	Plant Association	Topography	Soil Association	% Increase in Track Density	% Vegetation Decrease
1 Pit Area	Creosote scrub	Low sandy hill	Mojave-Adelanto	470**	15
2 Race Start	Creosote scrub	Bajada-gentle slope	Mojave-Adelanto	289	20
8 Race Course	Alkali Sink	Playa	Rosamond-Playa	72	27
11A Race Course	Creosote Scrub	Bajada-Steeper up slope	Anthony-Cajon-Arizo	41	20
13 Race Course	Cheesebush	Wash	Anthony-Cajon-Arizo	81	3
21 Race Course	Alkali sink-lake edge	Playa	Rosamond-Playa	106	3
26 Finish Area	Creosote scrub	Flats	Anthony-Cajon-Arizo	841	76

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* Data from Lathrop (1979)

** Corrected value

APPENDIX 9e

Direct Impacts of Off-road Vehicles On Vegetation[a]

Preface

In analyzing the various reports for this section two underlying weaknesses surfaced in many of the studies: (1) that the control plots selected were very heterogenous and therefore comparisons between control and experimental (ORV impacted) plots were difficult to assess, and (2) wrong use of statistics, particularly the student's T test. These problems might have been overcome by having a larger sample size to reflect the heterogenity of the vegetation and the use of nonparametric statistics.

All of the quantitative studies were site specific and often worst case areas were selected. Also, no attempt was made to analyze impacts on a regional or desertwide scale. However, these problems do not prevent the discernment of general trends. In addition, all of the worst case study locations contained areas of varying use intensity. This allows comparisons between areas of different disturbance levels. Most of the articles were concerned with effects from motorcycle activity and a few addressed 4-wheel drive impacts. The measurable, direct effects from ORV's are quite similar and plant response is similar regardless of what runs over them. The main differences lie in intensity of use and site qualities. From this information, a reasonable, probable outcome can be projected to most places in the desert as to direct ORV impacts.

Types of Impacts

There are two types of surface impacts occurring where ORVs traverse: (1) surface shearing and (2) surface compression or compaction (Wilshire et. al. 1978, Havland and Mitchell 1972). The later type is covered in the soil compaction section. Surface shearing disturbances (uprooting and disruption of root systems) and crushing effects (crushing of foliage, root systems and seedlings) are the direct impacts occurring on vegetation from ORVs (Wilshire et. al. 1978, Wood and Robertson 1976, Klock 1976, Luckenbach 1975, Stebbins 1974). These changes can be very subtle or extremely obvious depending on the intensity of use, rate of use and an assortment of environmental factors (intensity and pattern of rainfall, topography, soil type, etc.).

This report will focus on vegetational changes in plant density, cover, and diversity, caused by direct impacts from ORV activity in the California desert.

a) Extracted from Hall (1980)

Changes in Plant Density

Density is a measure of the number of plants per unit area and is a useful indicator of community change (Muller-Dombois and Ellenberg 1974).

All studies that measured plant density reported decreases in density in areas of ORV use. These decreases varied in degree depending on the intensity of use, and to some extent by the researchers ability to measure the changes. Keefe and Berry (1973) reported changes in density in areas of three different intensities of use in Dove Springs. Areas in Dove Springs were classified as barren, disturbed, and relatively undisturbed. Comparisons among the three types showed the relatively undisturbed areas as having 155.6 shrubs/150m^2, disturbed areas averaged 20.9 shrubs/150 m^2 (86.5% change in density), and no shrubs were observed in the barren area (100% change). Davidson and Fox (1974) concluded their poor statistical results reflected subtle site differences rather than motorcycle disturbances; however, with few exceptions their data showed an overall trend towards fewer plants in ORV use areas. On 16 plots of two hectares each (Bury et. al. 1977) the average number of creosote bushes per hectare was 240 on controls, 236 with moderate ORV use (about half of these plants were broken or damaged), 145 with heavy ORV use, and 84 in the pit area. Lathrop (1978) used aerial photographs taken in 1952 and 1973 of Dove Springs for same site comparison. The average plant density on four hillsides decreased 37.5% from 1952 to 1973, and a 59.0% decrease were noted in three pit areas. Ground density measurements of the same area indicated aerial photo analysis was conservative and decreases in plant density were larger. Other studies have shown similar decreases in plant density from ORV use (U.C.I. 1974, Vollmer et. al. 1976, Brodhead and Godfrey 1977, Sparrow et. al. 1978) and show that the severity of damage is correlated with intensity of use (U.C.I. 1974, BLM 1975, Vollmer et. al. 1976, Johnson, unpublished, Lathrop 1978).

Changes in Plant Cover

Cover has been defined as the proportion of the ground occupied by perpendicular projection of a plant species (Greig-Smith 1957). It is actually an estimation of the area covered by a given species and is expressed as a percentage (Kershaw 1973). Cover as a measure of plant distribution has been emphasized as being of greater ecological significance than density (Rice 1967, Daubermire 1968). This idea is based on the observation that cover gives a better measure of plant biomass than does the number of individuals, and biomass is the net primary production of a plant accumulated over time (Smith 1974). From this, inferences can be drawn on relative amount of energy in a system. A decrease in cover would reduce the amount of energy available to that system.

All the studies that measured plant cover in ORV impacted areas showed varying degrees of cover reduction. Lathrop (1978) showed a 90% decrease in perennial plant cover in Jawbone Canyon when compared with controlled areas. Hillside trails in Jawbone Canyon were classified according to intensity of use (sparse, dense and very dense tracks) and comparisons with controlled areas showed a 35%, 52% and 73% decrease in plant cover respectively. Lathrop conducted similar studies at Dove Springs, Stoddard Valley, Afton Canyon and along selected areas of the Barstow to Las Vegas race course. All showed similar findings. A general loss of plant cover is associated with ORV activity. Other authors reported similar results when comparisions were made between ORV use areas and relatively unused areas. Kuhn (1974) showed an 84.8% decrease in perennial plant coverage in selected areas of the Kelso Dunes. Snyder et. al. (1976) reported similar loss of plant cover in the Panoche Hills and Dove Springs. Other authors report similar findings (Davidson and Fox 1974, U.C.I. 1974, Johnson unpublished, BLM 1975, Wood and Robertson 1976, Duck 1978).

Changes in Plant Diversity

Diversity measures two characteristics: the number of different species within a plant community, and how similar in number those species are in the plant community (Lloyd and Ghelardi 1964, Pielou 1966, Watt 1972, Whittaker 1975). The importance of species diversity has many ramifications in biological theory and is supported by several specific arguments. Most of these arguments fall into one of three categories: (1) diversity promotes stability, (2) diversity provides a greater survival potential for a community, and (3) the diverse communities tend to utilize radiant energy more efficiently over the long term (Odum 1963, Daubermire 1968, Preston 1969, Lewontin 1969, Watt 1972, Whittaker 1975, Stebbins 1974, Vogl 1976).

Authors who measured plant diversity in ORV use areas reported decreases when compared with controlled areas. Kuhn (1974) reported 23.6% decrease in plant diversity along a foredune area of the Kelso Dunes. Keefe and Berry 91973) noted 26.5% decrease in diversity average over five Belt transects in disturbed habitat at Dove Springs. Lathrop (1978) reported a decrease of 82% in one pit area compared with a control, and noted diversity decreases along impacted hillsides varying from 42 to 58% depending on the intensity of tracking. Lathrop reported similar findings at Dove Springs. Authors suggested or their data indicated, that changes in diversity occur because smaller plants tend to receive the greatest degree of physical damage--ORV drivers tend to circumvent the larger shrubs (Keefe and Berry 1973, Kuhn and Gustafson 1974, BLM 1972, Johnson unpublished).

Some of the larger (older) shrubs, like creosote bush, have a recovery rate of 100+ years (Vasek et. al. 1975), while some of the smaller plants may live only 25 to 50 years. Thus the extent of damage the older plants receive determines the ultimate recovery time and stability (see recovery section) for the community (Johnson unpublished). The exact time of recovery is variable and may take between 10 and 100+ years.

Changes to Annual Species

Annual plants play a very important role in desert ecosystems. Annuals are short-lived and dependent on climatological factors; however, during favorable seasons they are a more important form of productivity than perennials (Johnson unpublished, Beatley 1969, Mooney et. al. 1976).

Annuals can respond dramatically to climatic and microsite conditions. This creates unpredictable models for annual density, cover and diversity. Because of this inherent problem, few articles have addressed changes in annual quantities from ORV activity. Johnson (unpublished) measured perennial and annual plants radiating out from a pit area in Johnson Valley. At the pit site no annuals were growing, 400 meters (1/4 mile) from the pit, two species were present but the densities were so low as to register zero, 800 meters (1/2 mile) from the pit twelve species were observed with a density of 9 plants/m^2. When measurements were made on similar sites not as disturbed, the density was 30 plants/m^2 and a diversity of seventeen species was present. Vollmer et. al. (1976) reported a reduction in annual plant density from 39/m^2 to 24/m^2 depending on intensity of use (control had 46/m^2). These differences may be related to site differences and not from ORV use. However, when differences were compared between ruts and humps of tracks and other parts of the test area the differences were judged to be caused by the experiment. In another study conducted by the University of California, Irvine (1974), an investigation on the effects of ORV and campsite use on the germination success of summer annuals was done near Joshua Tree. Enclosed plots in disturbed and undisturbed areas were subjected to artificial rainfall, and indices of density and diversity were derived. Results showed an 83.2% decrease in density in the motorcycle use enclosure compared to the control, and a 90.0 decrease in density when the campsite area was compared with the control. These differences were attributed to soil compaction which decreases infiltration rates. Soil leaching from infiltration is often very necessary for annual germination (see soil-plant relationships). However, some species tend to show a positive increase from ORV use. Species diversity in the motorcycle plot was considerably higher than in the control plot, while species diversity in the campsite plot was lower than the control (U.C.I. 1974). The positive effects were believed to be related to an increase in microsites formed by ridges in the soil surface. This effect was considered minimal due to the relatively small number of individuals that germinated.

Other studies (see soil-plant relationships) conducted by BLM show a decrease in summer annual production in vehicle tracks made after heavy summer rains.

Intensity of Impacts

There is a paucity of quantitative data about the intensity of ORV use and the degree of vegetation change. Most authors report the greater the ORV use the greater the changes in plant cover and density (Keefe and Berry 1973, Davidson and Fox 1974, Burry et. al. 1977, Wood and Robertson 1976, Duck 1978). Studies are often designed by locating areas of various degrees of disturbance and measuring effects on plants in each area. Few studies have taken the approach of measuring vegetation before and after disturbances in the same area. If the disturbances can be controlled, i.e., number of passes over a given point, then a quantification of intensity can be made (Mispagel and Zembal 1978). The BLM (1978) study (see soil-plant relationships) is one of two studies that takes this approach and provides some insight on this topic. Otehr authors have taken other approaches and reach similar conclusions. Johnson (unpublished) reports a decrease in plant damage from ORV use as distance increases from a pit area in Johnson Valley. Within the pit area there were no plants (100% soil disturbance), 800 meters away 74% of the small plants (less than 2 feet) and 51% of the larger plants (3-4 feet) received between 10 and 50% damage (99% of soil surface disturbed), at 3,200 meters from the pit 34% of the small plants and 15% of the larger plants received between 10 and 50% damage (70% of surface disturbed). From this a disturbance gradient can be visualized, radiating out from an area of high disturbance to low. A similar study was conducted by the University of California, Irvine (1974). Studies on creosote bush densities reported that damage appeared to increase exponentially as the distance increased toward the interior of the campsite. In a special study for BLM (Lathrop 1978) on plant responses to ORV activity, several types of measurements were made to record changes in plant density. An approach similar to Johnson (unpublished) was used to record changes in shrub density radiating out from a pit area in Johnson Valley. Distances were at 100 meter intervals for 600 meters, at six different compass bearings from the center of the pit area. Comparisons were made of 1952 and 1977 aerial photos. When averages of percent change were made for each of the 100 meter intervals, a decrease was observed at all intervals (45%, 52%, 69%, 55%, 28% and 40%, respectively). However, no clear intensity gradient is observed. This probably occurs because: (1) more intervals should be taken further from the pit, (2) the ORV activity may not be the only factor influencing the decrease in plant density. This data indicates a trend between degree of vegetation change and intensity of impacts. A study completed in Rock Valley, Nevada (Vollmer et. al. 1976) reported the results of driving 4-wheel vehicles over a fixed and random course for a set period of days. Estimates were made of plant damage to 487 shrubs from random driving and of plant damage to 147 shrubs in the regular track. Shrubs exposed to repeated driving (regular track) were severely damaged, averaging 76% estimated damage, while the random driving averaged 38% estimated damage. Definite correlations existed between the regularity (intensity) of driving and the degree of damage to a shrub.

In a study at Cape Cod National Seashore, Massachusetts, the effects of controlled impacts on plant biomass were measured on coastal habitats (Brodhead and Godfrey 1977). Plots were established and treatment consisted of 0 (control), 270 (medium) and 650 (heavy) passes of a 4-wheel drive Jeep. The mean biomass/m^2 for each plot was reduced to a percentage to correct for initial differences between plots, and was seasonally corrected by comparison with the appropriate control. Beach grass biomass measurements on the heavy impact plots showed the foredune biomass had declined to 25% and the dune biomass to 15% of the initial biomass. A similar pattern was noted under a medium intensity of impact with a biomass reduction of 42% in the foredune and 34% in the dune. These figures were calculated from tracks 3 meters wide and apply only to areas impacted by the Jeep. From this study, an increase in the number of passes decreased the amount of available photosynthetic tissue of the plants and hence, the general health of the plants. Further, the authors concluded with cessation of impacts a period of vegetative regrowth can be expected (see recovery section) with the species studies.

Positive Changes

Some authors have indicated man-caused disruption to vegetation may not always have negative effects. Johnson et. al. (1975) compared vegetation along road edges with nearby undisturbed areas in the desert. The vegetation along the road edge showed significant increases when compared with undisturbed areas. Density increased by 65.8%, percent cover increased by 81.6% and above ground biomass increased by 85.0%. The authors concluded that roads can act as water harvesting systems (compacted soil can reduce infiltration and increase runoff) and runoff from the roads is collected along the edges. This increase in water supply creates greater plant growth. This same sort of phenomenon may take place with ORV tracks and trails. Transect data from the Lathrop report (1978) showed a 22% increase in annual cover in-tracks as compared with out of tracks at one pit area. This hypothetically was due to an edge effect. Studies by the University of California, Irvine (1974) showed an increase in annual plant diversity (based on Shannon-Wiener Index) in motorcycle tracks as compared with controls. The speculation on this observation was the creation of new microsite in and along the track edge. This would create a higher diversity of species; however, the authors note there was still a decrease in the number of individuals per species and any minor positive benefits would be offset by the decrease in individuals.

Ecosystem Implications of Vegetation Changes - Short and Long-Term Effects From Direct Impacts

There are three possible outcomes from an ORV running over a plant. Each outcome is tempered by the intensity and season of impact. A plant may be uprooted, desiccate and die, or have the foliage broken down and curshed to a condition where no photosynthetic material is left to produce energy (Klock 1976, Davidson 1973). In this situation, resprouting may take place (Beatley 1974) but this is dependent on the amount of root energy reserve available and the intensity of ORV use. A second type of impact can reduce plant foliage through breakage and partial crushing of branches. This decreases the photosynthetic surface and above ground biomass, which reduces plant productivity (Vollmer et. al. 1976). Losses in above ground biomass reduce the carbohydrate reserve available to the root system and could starve the plant (Vollmer et. al. 1976). Again, the plant may be able to resprout but may require a 10 to 20 year period for recovery (Beatley 1974; Vollmer et. al. 1976). A third type of impact may partially crush plants and damage root systems. This would decrease the plant water uptake ability and photosynthesis. This would lead to a reduction in carbohydrates production and the plant could starve. These seemingly simple scenarios are far more complicated than what appears, because of the far reaching and often subtle effects that happen to a plant community.

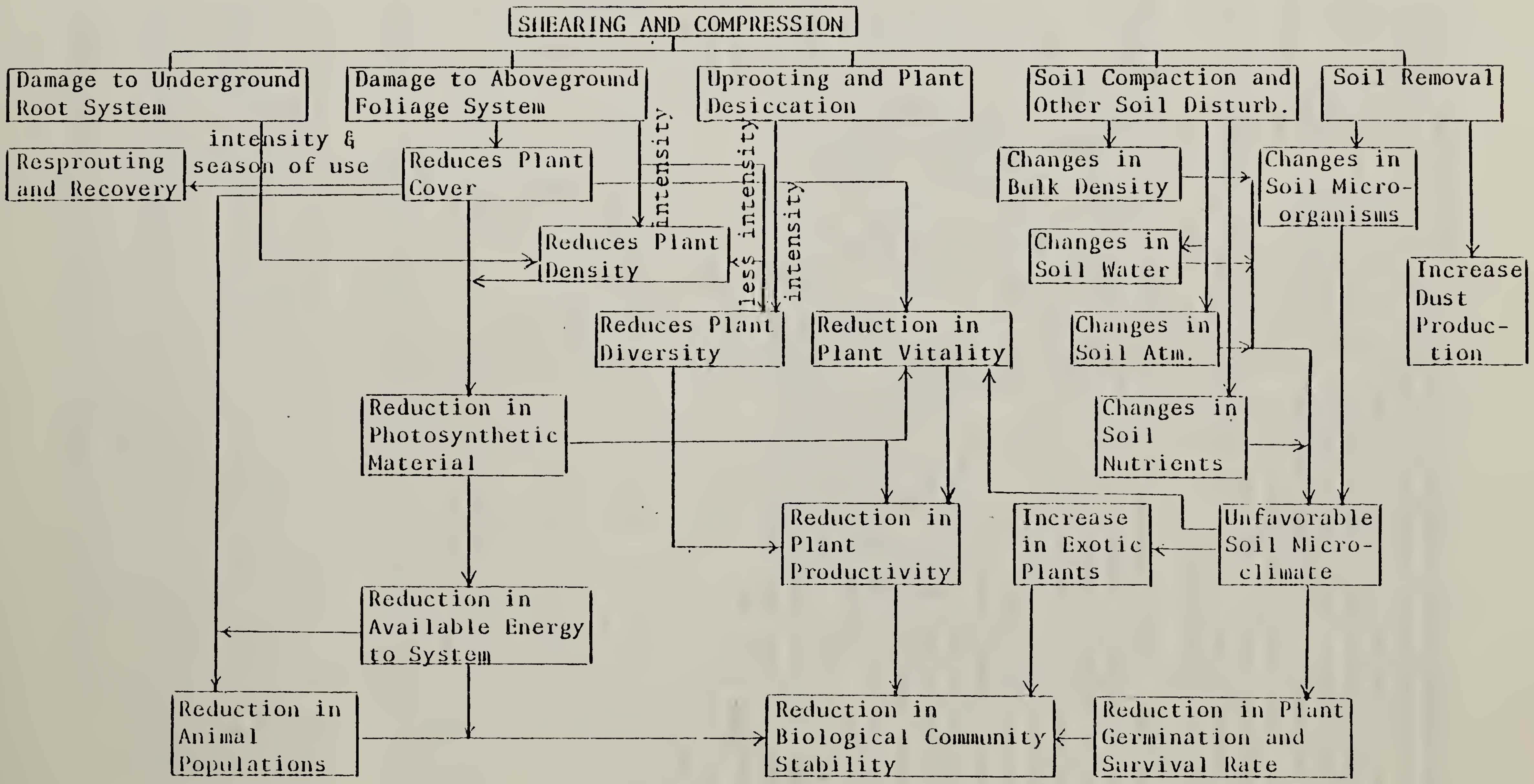
From the research gathered and analyzed, generalizations as to the effects of ORV use on vegetation can be predicted: (1) ORV use will reduce perennial plant cover and above ground biomass. The degree of loss is dependent on the intensity of use (Lathrop 1978, Kuhn 1974, Snyder et. al. 1976, Davidson and Fox 1974, davidson 1973, U.C.I. 1974, Johnson unpublished, BLM 1976, Wood and Robertson 1976, Duck 1978), (2) a reduction in perennial plant density often occurs in ORV use areas, especially in areas of moderate to heavy use (Keefe and Berry 1973, Bury et. al. 1977, Lathrop 1978, U.C.I. 1974, Vollmer et. al. 1976, Broadhead and Godfrey 1977, BLM 1975, Sparrow et. al. 1978. The terms "moderate" and "heavy" have not been quantitatively defined, but are relative terms and may vary from site to site), (3) in areas of ORV use (primarily open competitive or extensively used areas) the smaller shrubs are often the first to be damaged and eliminated from a use area (this tends to reduce the plant diversity of the impacted area as indicated by Keefe and Berry (1973), Lathrop (1978), Kuhn and Gustafson (1974), Hall (personal observation), BLM (1972), Johnson (unpublished), (4) annual species are affected in similar ways to the perennials (Johnson unpublished, Vollmer et. al. 1976, U.C.I. 1974, Lathrop 1978); however, slight disturbances may cause no measurable differences or show some positive response by increasing cover or diversity (Lathrop 1978, U.C.I. 1974), (5) the degree of use intensity is directly related to degree of plant change and environmental factors (Johnson unpublished, U.C.I. 1974, Vollmer et. al. 1976, Lathrop 1978, Broadhead and Godfrey 1977), (6) perennial plants can recover from some ORV impacts. If the plant has not been completely killed and if sufficient time is given between impacts, then many species will resprout (Vollmer et. al. 1976, Hall personal observation, BLM 1977, Lathrop 1978). Best estimates on perennial plant recovery would be a 10-20 year period (Beatly 1974, Vollmer et. al. 1976); however, soil recovery may be much longer (see recovery section). These types of changes can have large scale implication on the whole ecosystem depending on the size and/or extent of the disturbance and the frequency and intensity of impacts.

Conclusions of the various authors on ORV impacts and effects on vegetation can be interpolated as to effects on the plant community. These effects would in turn affect other life forms dependent on vegetation. Projecting what the ecosystem and long--term effects would be is very difficult because the biological, environmental and impact processes are not fully understood. Therefore, predicative computer modeling would not be feasible at this time; however, general trends and condition can be estimated (see figure following).

As plant cover and density is reduced so is the amount of photosynthetic material for energy production. This reduces plant vitality and available energy to the ecosystem and reduces community stability. As plant diversity is reduced, so is plant productivity and community stability. Other impacts affect soil characteristics which affect vegetation (see soil-plant relationships). All of these affect the animal populations dependent on vegetation. These sequences, with ecosystem implication, would occur if large areas were highly disturbed or if a series of smaller areas of close proximity wre highly disturbed. A few authors have projected estimates on rate and extent of ORV impacts.

Keefe and Berry (1973) estimated that 960 acres of Dove Spring Canyon has been intensively damaged by ORV use. Of this about 240 acres have been denuded of plant cover. Of the remaining 4,060 acres of the open area, another 303 acres have been denuded by trails. Through extrapolation they estimated 1,086 acres would be lost in 10 years and 1,629 acres in 20 years. The 1,629 acres constitute about 32% of the total Dove Springs open area. Bury et. al. (1977) estimated that a square kilometer of creosote shrub habitat (Johnson Valley, Anderson Valley, Stoddard Wells area) would contain about 6,650 terrestrial vertebrates weighing about 285 kilograms. According to their study, heavy ORV use over 1 km^2 would destroy about 3,000 individuals and 220 kg. in animals. Moderately used areas, about 830 individuals would be lost and 185 kg/km^2. These types of extrapolations are very simplistic and the numbers are probably not true reflections; however, the trends are accurate and do show the negative outcome of moderate-heavy ORV use.

SIMPLISTIC VIEW OF ORV IMPACTS ON SOILS AND VEGETATION
(Descriptive model, not a numerical model)



SHEARING AND COMPRESSION
Damage to Underground Root System
Damage to Aboveground Foliage System
Uprooting and Plant Desiccation
Soil Compaction and Other Soil Disturb.
Soil Removal
intensity & season of use
Resprouting and Recovery
Reduces Plant Cover
intensity
less intensity
intensity
Reduces Plant Density
Changes in Bulk Density
Changes in Soil Micro-organisms
Changes in Soil Water
Increase Dust Produc-tion
Reduces Plant Diversity
Reduction in Plant Vitality
Changes in Soil Atm.
Changes in Soil Nutrients
Reduction in Photosynthetic Material
Reduction in Plant Productivity
Increase in Exotic Plants
Unfavorable Soil Micro-climate
Reduction in Available Energy to System
Reduction in Animal Populations
Reduction in Biological Community Stability
Reduction in Plant Germination and Survival Rate

Lines indicate potential outcomes. The intensity of use, seasonally, environmental factors all play a complicated and not fully understood role in determining degree of impact.

APPENDIX 9f

Comparison of Significant Impacts to UPAs and RT&E Plants by Alternative

KEY ISSUES

IMPACTS OF THE FOLLOWING USES ON UNIQUE PLANT ASSEMBLAGES (UPA)	NO ACTION	PROTECTION	BALANCED	USE
Motorized Vehicles	1 UPA in 13 open areas. 15% of UPA currently impacted (20,000 ac.)	Same as No Action, except 12 open areas.	Same as No Action, except 12 open areas.	1 UPA in 19 open areas. 80% of UPA could be impacted.
Livestock Grazing	39 UPA's fall within 54 allotments. Currently 102,147* AUM's have been calculated. This is 6,282 AUM's over the proposed range carrying capacity.	42 UPAs fall within 67 allotments. Proposed 74,651 AUMs. This would be 21,214 under proposed range carrying capacity.	Same as Protection Alternative. Proposed 79,161 AUMs. This would be 16,704 AUMs under range carrying capacity.	Same as Protection Alternative. Proposed 83,057 AUMs, which would be 12,808 AUMs under range carrying capacity.
Mineral Development and Exploration (Data for So. Half of CDCA Only).	11 UPAs fall within current minerals areas. Impacts could range from up to 100% damage in 5 UPAs, 50% in 3 UPAs and 33%, 20% and 10% in the remaining 3. Impacts tend to localized therefore total disturbance over whole UPAs is not likely.	Up to 20% of one UPA could be impacted.	5 UPAs could be impacted. Ranging from 1 to 33%.	19 UPAs could be impacted. ten UPAs could be disturbed up to 100% of their total area. Eight UPAs could be disturbed from 33-50% of their area, and one UPA up to 15%.

	NO ACTION	PROTECTION	BALANCED	USE
Electrical plant sites	unknown	4 UPAs could be impacted from 4-100% of their area.	7 UPAs could be impacted from 5 sites.	15 UPAs could be impacted from 11 sites.
KGRA	unknown	10% of one could be impacted.	Same as Protection Alternative.	3 UPAs from 1 KGRA and 2 wind gen. stations.
Corridors	unknown.	9 UPAs could be impacted from 4-100%.	Same as Protection Alternative.	16 UPAs could be impacted from 13 corridors.
Visitor Stations	3 UPAs on 2 sites.	14 UPAs	12 UPAs	16 UPAs
Land Tenure	No impacts.	5 UPAs on 30,000 ac.	5 UPAs on 38,400 ac.	6 UPAs on 32,640 ac.

* The higher the AUMs the more intense the grazing use would be over the same allotments.

IMPACTS OF THE FOLLOWING USES ON RT&E PLANT SPECIES

Motorized Vehicles	8 species within 13 open areas	8 species within 6 open areas	8 species within 12 open areas	13 species within 9 open areas
Livestock Grazing	49 species within 54 allotments	54 species within 67 allotments, on 74,657 AUMs	Same as Protection Alternative, on 79,161 AUMs	Same as Protection Alternative, on 83,057 AUMs
Mineral Development	unknown	17 species within 7 polygons	29 species within 11 polygons	106 species within 47 polygons
Energy				
Electrical plant sites	unknown	8 species within 2 sites	15 species within 7 sites	16 species within 9 sites
KGRA	unknown	8 species within so. 1/2 CDCA	same as Protection Alternative	Same as Protection Alternative
Corridors	unknown.	17 species within 9 corridors	17 species within 9 corridors	20 species within 13 corridors
Visitor Stations	8 species within 2 sites	41 species	56 species	49 species
Land Tenure	No impact	1 species	1 species	1 species

Appendix 9

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Appendix 10 b (i)

Cultural/Native American Element

Methods of Determining Impacts

The positive and negative effects of managing cultural resources and Native American values on wildlife species and habitats were determined in a two step process;

1) Identification of the types of impacts created by implementing each management guideline or activity, and

2) Analysis by plan alternative of the wildlife resources affected by specific management proposals.

To accomplish step one, data were compiled on the types of active management programs proposed in the Archeological-Historical Resource Zone, Public Interpretive Use Zone, and Archaeological-Historical Preservation Zone included in the Cultural/Native American Element. Other management proposals in the element and management constraints included in the cultural resources and Native American values section of the multiple use guidelines were also analyzed. Subsequently, staff specialists on cultural resources and Native American values were interviewed to determine the precise nature of specific actions allowed or encouraged under each management category. The data gathered in step 1 were used to determine whether proposed Cultural resources/Native American values management techniques would have beneficial, detrimental or no impacts on wildlife resources.

To assess the effects of the cultural resources/Native American element on wildlife resources (step 2), a map depicting specific management actions was overlaid on wildlife resource maps showing habitat for Federal endangered species, state-listed rare and endangered species, BLM sensitive species, BLM proposed sensitive species, and selected significant species, and on maps showing special habitat areas and wildlife management areas. The kinds of wildlife resources and multiple use class falling within each cultural resources/Native American Values resource management area were recorded.

Nature of Impacts

Most management guidelines and programs proposed in the cultural resources/Native American values element are designed to protect those resources through limitations on incompatible and destructive uses, and through increased enforcement of regulations. These management actions would provide protection to important wildlife resources found within Archaeological-Historical Resource Zones, Public Interpretive Use Zones, and Archaeological-Historical Preservation Zones, and are therefore beneficial to wildlife.

A few specific cultural resource activities could have direct negative impacts on wildlife resources, others could have indirect effects by limiting wildlife management activities. Conflicts are usually limited to a small areas and would be serious only if near a sensitive wildlife resource such as an important water source, raptor eyrie, or habitat for rare, threatened, endangered, sensitive or significant species. Excavation techniques destroy wildlife habitat; the area disturbed is usually small unless unusual research techniques are employed (e.g., Davis, 1978). Habitat disturbances in sensitive wildlife habitats are most likely to occur near oases, where wildlife and human use concentrate. Preservation techniques such as rodent control to prevent destruction of artifacts and disturbances to strata, and construction of flood diversion dams to protect large sites could have serious local deleterious effects on wildlife resources, but are used infrequently. Increased visitor use at interpretive sites could cause trampling of habitat and disturbance to wildlife. Cultural reosurce management to protect sites near springs could place restrictions on development of water sources for wildlife, placement of guzzlers, and tamarisk control programs.

Guidelines and activities for management of Native American values are also designed generally to protect existing values, and are beneficial to wildlife. The only apparent area of potential conflict is harvesting of native animals for ceremonial uses. However, the number of animals taken is small, and the general goal of most Native Americans is to manage animal populations in a condition that would allow harvesting for traditional uses (Robert Laidlaw, pers. comm). The potential impact of collecting native foods is not documented, but could be significant locally if done intensively and repeatedly over a small area, especially in drought years.

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APPENDIX 10a

Impacts of General Recreation on Wildlife

Methods of Determining Impacts

Five methods were used to gather information about actual and potential positive and negative impacts of general recreational activities on wildlife: a review of the literature, information from contractors working in the field between 1974 and 1979, the collective experience of California Desert Plan Program wildlife staff members in the field, information from the California Desert Plan Program recreation staff members, and best professional judgement based on the above four.

Fellers (1979) undertook an analysis of the literature and prepared separate reports for the following topics: birdwatching, camping and picnicing, driving on unpaved roads, equestrian use, falconry, hiking and rock climbing, photography, rock and mineral collecting, sightseeing, target shooting, painting, hang gliding, sand sailing, hunting, and research and education. In some cases, information contained in California Desert Plan Program contracts was incorporated into these reports. Wildlife contractors also volunteered information about their contacts (if any) in the field with general recreation users. In some cases, contractors described situations in their reports or field notes (i.e. Cord and Jehl, 1978; 1979; Weinstein, 1979; O'Farrell, 1979; Fritts, 1979; Harmata, Geduldig, and Durr, 1979; McGurty and Ruth, 1978; McGurty, 1979; Remsen, 1976).

The wildlife staff members (over 20 in number) who have been involved in desert studies for the last several years contributed valuable information on effects of camping, shooting, hunting, research and education, photography, rock and mineral collecting, falconry, and many other subjects. The information was usually site-specific and dated.

Information from the California Desert Plan Program recreation staff members was derived from such sources as the report by Stanford Research Institute (SRI) International (1978) on "Demographic and Economic trends in the California Desert", the paper prepared by Stebbins et al. (1977) entitled "Teaching and research in the California Desert", a report by Environmental Information Service (1977) on "A study of organized recreation group use in the California Desert", a Field Research Corporation (1977) report entitled "California public opinion and behavior regarding the California Desert", and a Natelson Company, Inc. (1978) report entitled "A study of recreation use at selected locations in the California Desert." In addition, a map showing concentrated recreational use zones was used. The map, prepared by the recreation staff, was derived using the above reports, as well as an analysis of CDCA aerial flight data from 1973 to 1978 and a map showing intensity of use nodes (1979). It was a key element in evaluation of the existing situation for baseline levels of impacts. The existing situation was used in all cases for comparison of the No Action and action alternatives. However, in calculating potential impacts to wildlife resources over the next 10 years, very conservative estimates were used. It is highly likely that impacts will be more severe than noted.

Nature of Impacts: General Recreation

The following summary of impacts was taken largely from a review of the impacts of various forms of recreation prepared for the Bureau of Land Management by Joan Fellers (1979). Both negative and positive impacts occur and specific types of impacts may result from one or more forms of recreation. The following are several examples.

Specific negative impacts have been identified for such activities as trapping, hunting, bird watching, camping and picnicing, driving on unpaved roads, equestrian use, falconry, hiking and rock climbing, photography, rock collecting sightseeing and indiscriminate shooting or "plinking." Negative impacts as a result of hunting and trapping include wildlife population declines, skewed age and sex ratios, reduction in food for the natural predators of game species, disturbance of species intolerant to human activity (such as bighorn sheep) intense disturbance of riparian habitat, indiscriminate shooting, and damage from associated use of off-road vehicles. Removal and disturbance of vegetation, wildfires, littering, soil compaction, contamination of water supplies disturance of breeding behavior in birds and general vandalism may result from camping, picnicking and equestrian use. Equestrian use may also involve the creation of new trails use of support vehicles which involve additional impacts. Other specific types of impacts that result from the remainder of the recreational pursuits mentioned previously include disturbance of nests and breeding behavior in birds, destruction and disturbance of habitat, destruction and/or removal of animals from populations, collection of animals and increased mortality of wildlife along roadsides.

Many positive impacts on wildlife can result from recreational pursuits also. Such beneficial impacts have been identified for nearly all forms of recreation noted in the previous paragraph. An appreciation of wildlife and natural habitats and an increased desire to protect natural wildlife resources is a potential impact common to most forms of recreation. Such pursuits as trapping and hunting can have more specialized benefits such as raising of revenue for wildlife management practices (through hunting and fishing licensing), regulation of game populations, installation of water sources in arid areas, and knowledge of predator populations (trapping). Commercial collecting and falconry can provide animals for use in scientific and educational programs and produce data on breeding techniques and conservation practices. The use of films and photographs may result in the further promotion of wildlife appreciation.

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APPENDIX 10b (iii)

Impacts of Motorized Vehicle Element on Wildlife

Methods for Determining Impacts

Several methods were used to determine the kinds and degree of impacts of the motorized vehicle element on wildlife. These techniques included review of published and unpublished literature (including Bureau-sponsored studies); examination of aerial photographs; personal expertise of staff specialists based on actual visitation of many areas from the 1960's to the present, on frequent aerial flights over many sites during the last 10 years, and on slide collections of impacts at particular sites; and professional judgment based on all of the above. The kinds of wildlife resources that might be affected by open areas were identified by overlaying transparent maps showing open areas for the No Action and action alternatives on maps showing wildlife resources (officially listed, sensitive, "proposed" sensitive, and significant species, as well as representative ecosystems and unique or sensitive areas). The amount of a specific wildlife resource occurring within each open area was recorded in square miles. Information on important wildlife resources immediately adjacent to the open area was also noted. Wildlife resources affected by either the designated or existing roads and ways classification were assessed in a similar manner. Maps showing the location and distribution of C, L, and M classes were placed over maps showing the various wildlife resources; the amount of a specific wildlife resource occurring within each land-use class was then recorded in square miles.

In all cases, the existing situation and condition of the land with regard to wildlife resources were used as a baseline for measuring amount, type and degree of impact. The Interim Critical Management Plan for Off-road Vehicles was incorporated as part of the baseline. A map showing the locations of unauthorized vehicle use areas was used also; this information was taken into account in considering the existing condition of the wildlife habitat.

NATURE OF IMPACTS

This section is divided into two parts: the effects of open areas on wildlife, and the effects of designated and existing roads and trails on wildlife.

Effects of ORV Open Areas on Wildlife

General Effects

Off-road vehicles are known to have serious impacts on vertebrate species and their habitats. Such authors as Luckenbach (1975) and Stebbins (1974) have described general impacts to wildlife and to habitats. More specific discussions relating to California desert habitats on effect of soils can be found in Eckert et al. (1977), Gillette et al. (1979), Nakata et al. (1976), Synder et al. (1976), Stull et al. (1979), Webb (1978), Webb et al. (1978), Wilshire and Nakata (1976, 1977 and 1978). Essentially, vehicle use off-road causes soil compaction, erosion, destruction of crusts and lag gravel surfaces and loosening of sandy soils. Papers describing impacts on vegetation in the Mojave Desert include: Davidson and Fox (1974), Duck (1978), Keefe and Berry (1973), Johnson et al. (1979) and Lathrop (1979). In general ORV use caused loss of shrub cover and diversity, denudation and inhibition of germination of certain annuals and perennials.

Bury et al. (1977) in a study of the effects of ORV's on desert vertebrates in the west-central Mojave Desert, noted that numbers of reptile, bird and mammal species in heavily used and pit areas were 55% and 20% of undisturbed areas. Biomass estimates were even lower (23 and 17%, respectively).

Effects of ORV Noise on Wildlife

Recent studies have shown that the hearing abilities of birds (Marler et al. 1973), mammals (Bondello and Brattstrom 1979b), and reptiles (Bondello et al. 1979) can be permanently impaired by motorcycle and dune buggy noises. Hearing loss in the Mojave fringe-toed lizard and desert kangaroo rat occurred after a 500 second exposure of vehicle noise at 95dB (Bondello and Brattstrom 1979a, b). Ecological and behavioral evidence suggest that these hearing losses could lead to higher mortality among prey species due to decreased predator detection abilities. Bondello et al. (1979) found that Couch's spadefoot toads would emerge from burrows following 10 to 30 minutes of recorded motorcycle sounds in a laboratory experiment. If this occurs under field conditions, emerging toads would die from desiccation and starvation. The short duration of exposure indicates that the impacts on wildlife caused by high level noise could occur near roads, ways, washes, campgrounds, and areas open to unrestricted ORV use. In addition to those species already studied, similarly deleterious effects are also expected on other vertebrate species. Studies by Weinstein (1978) and Luckenbach (1978) indicate that most birds avoid areas intensely used by ORVs, reducing the chance of incurring hearing damages, but creating an area with lower breeding bird densities.

Effects of Open Areas on Specific Wildlife Resources

Desert Tortoise. The desert tortoise is a BLM "sensitive" species and is under "status review" by the Office of Endangered Species. It will be proposed for federal threatened status by the Office of Endangered Species in late 1979 or early 1980. Four areas of potential critical or crucial habitat in the CDCA will be considered at this time.

Off-road vehicle use affects tortoises by: 1) direct killing of tortoises on the surface or in subsurface burrows, 2) crushing nests of eggs, 3) damaging habitat used for cover (compacting soil crucial for burrow construction, crushing burrows, destroying perennial and annual vegetation used for cover), and 4) damaging habitat components used for forage (crushing annuals used for food, compacting soils so food plants will not germinate, fostering growth of unpalatable weeds, etc.) (Bury 1978; Berry and Nicholson 1979). Tortoises are also shot by recreationists. Another and more difficult topic is the effect of noise on desert tortoises. Based on recent studies by Bondello and Brattstrom (1979) of other species of small desert vertebrates, including reptiles, there are strong indications that ORV noise may deleteriously affect tortoise hearing sensitivity, potentially increasing mortality rates from predation and otherwise altering adaptive behaviors.

Bury (1978), in a special study of the effects of ORVs on desert tortoises in the Stoddard and Johnson Valley Open Areas (central Mojave Desert), found marked reductions in tortoise numbers in heavily used and pit areas. In fact tortoise populations were essentially destroyed. Data gathered desert-wide on tortoise poulations (Berry and Nicholson, 1979) and new data gathered in spring 1979 (Barrow, field notes), indicate tortoise populations are estimated to have declined from densities of 200 to 100 per square mile in the least disturbed areas of Stoddard Valley within the last 4 to 5 years and are still in a serious state of decline. The cause for these declines is human-related and primarily ORV. Data from the Rand Open Area on tortoise populations is available for 1976, 1978 (Berry and Nicholson 1979) and for spring 1979 (Stewart, field notes). The data again are for a "least disturbed" area and indicate declines of 5 to 10 percent year.

Existing Open Areas such as the Rand Mountain, Johnson Valley and Stoddard Valley Open Areas have highly fragmented tortoise populations because of the numerous heavily used and pit areas interspersed with moderately and lightly used areas. Thus there are localized areas where tortoises have been extirpated or nearly so near to or adjacent to populations of higher density that are rapidly declining. Once population levels drop below a critical density recovery will not be possible and additional extirpations can be expected.

Flat-tailed Horned Lizard. This species is limited in distribution to the Colorado Desert and is found only in certain areas, often with some windblown sand. It is currently a proposed BLM "sensitive" species and is under "status review" by the Office of Endangered Species.

Studies by Dr. Fred Turner (1978, 1979) have revealed that there are few areas within the geographic range of this species where densities are high or moderately high. In most areas, there are few lizards and few lizard sign. Four areas of crucial habitat have been outlined (Turner, pers. comm.).

All or portions of two crucial habitat areas are open areas in one or more of the plan alternatives. It is also important to note that museum and old collection records indicate other areas had good concentrations or good numbers at one time. ORV impacts to date may have severely depleted numbers.

ORV use can be expected to have severe impacts on this horned lizard, especially when heavy use is confined to a few square miles. In general, these impacts are: crushing of the lizards on the surface and in subsurface burrows or subsurface resting sites; damage to vegetation that provides forage for the prey (ants); damage to the ant mounds and nests (again, damage to prey); and noise, which may reduce hearing sensitivity (Bondello and Brattstrom 1979). Studies by Bury et al (1977) on lizards and small vertebrates in general indicate that heavily used off-road vehicle areas and pit areas have severe impacts on the species that were examined (including horned lizards).

Colorado fringe-toed Lizard. The impacts would be the same as described above for the flat-tailed horned lizard. In addition, Bury's 1978 report outlined impacts specifically on the Colorado desert fringe-toed lizard. He found 61 fringe-toed lizards in 3 two-hectare control plots where there was no ORV use, whereas he found only 3 lizards in the same sized ORV use plots, a difference of 20-fold.

Prairie Falcon and Golden Eagle. Numerous Prairie Falcon and Golden Eagle foraging areas, eyries, and core breeding areas will be affected by open area designations. Each pair of Prairie Falcons can use from 40 to over 60 square miles of habitat in a good year (more in a poor year) (estimates based on report by Harmata et al. 1978). Each pair of Golden Eagles uses from 25 to 50 or more square miles for foraging habitat (Olendorff, pers. comm.). These foraging areas have been identified by England (1979) as part of eight crucial core habitats for raptors in the CDCA. The core areas have the highest known densities currently and historically of Prairie Falcons and Golden Eagles in the CDCA.

According to the Harmata et al. 1978 study, Prairie Falcons avoided parts of their foraging areas that were used by weekend recreationists and returned only after visitors had left. Harmata et al. performed their studies in the Red Mountain-Spangler Hills area, and there are also data from field surveys in the general vicinity of the Spangler Hills Open Area. Falcon eyries at Castle Butte and Robbers Roost have been disturbed regularly by ORV and other recreationists and nesting failures have been documented on an almost yearly basis (BLM contract field notes for Boyce, Harmata, Woodman, etc.). The nest at Red Mountain is believed to have failed during 1978 because of campers staying underneath the eyrie and because of shooting.

Harmata et al. 1978 also reported a potential scooping of the eyrie in the Searles Valley-Pinnacles area (also part of the Spangler Hills Open Area, or near to it). He found that one of the monitored pairs had four fledglings missing; they may have been replaced by a much younger fledgling by the nest robbers.

The same kinds of avoidance reactions, scooping, and disturbances can be expected to occur with Golden Eagles. With increased and continued human use, the possibility for continued and increased disturbances exists. Shooting of and at raptors does occur in the Mojave Desert and has been recorded on a number of occasions by California Desert Program contractors and personnel as well as California Dept. of Fish and Game wardens (Boyce, BLM contract field notes; Harmata, pers. comm., etc.).

Another important problem is the effect of ORVs on the foraging area of these raptors. ORVs have deleterious impacts on small vertebrates (Bury et al. 1977). Bury et al. (1977) found that vertebrate numbers were decreased by 55% and 20% in heavily used and pit areas, respectively, and biomass by 23% and 17%. Byrne (1974) and Busack and Bury (1974) had similar findings for mammals and lizards, respectively. The animals studied are those that are included in the diet of these raptors (Thelander 1974, Garrett and Mitchell 1973). Prairie Falcons take reptiles and small diurnal rodents, occasionally birds, whereas Golden Eagles feed on rabbits and rodents in this part of the desert. Prey would be substantially reduced in the foraging areas. Thelander (1974) has noted: "those areas where human activity has included the destruction of golden eagle foraging areas, prey populations or nesting sites, permanent exclusion of nesting golden eagles has occurred." (The same can be expected of Prairie Falcons.) Eventually, if ORV use continues, foraging habitat in open areas will be damaged to the point where prey species would either no longer exist or be in such low numbers that raptors could not survive.

It should be noted that the impacts of ORV use will extend beyond the Open Area. It is highly likely that recreationists will visit canyons in adjacent mountain ranges and eventually camp in the vicinity of the eyries. In that event, impacts could escalate.

Desert Bighorn Sheep. The desert bighorn sheep is a proposed BLM sensitive species. Aside from the habitat loss which will accompany unrestricted ORV use, bighorn sheep are sensitive to noise, human presence and other related problems. Lambing occurs with the period of February to May. Nervousness and stress, both physiological and mental, in ewes can affect lambs (Hansen 1971). Sheep are especially bothered by irregular human disturbance of an area such as a lambing ground or water source. Irregular use may occur as a result of increased use and access by ORV. Jorgensen (1974) reported that bighorn sheep in Anza Borrego State Park decreased their use of a watering area by nearly 50% on days when vehicles were used in the area. Studies of impacts of ORVs on other species have showed declines because of habitat loss, noise, harassment, and a number of other reasons. Thus we might expect the same of bighorn sheep.

Associated problems resulting from the increased accessibility to remote areas can include an increased incidence of poaching or pollution or degradation of critical water resources from camping activity.

Mule Deer. Unrestricted ORV activity can be expected to damage vegetation used for forage and cover; intrusion of vehicles and noise will disturb solitude and affect breeding and other behaviors. Noise levels may be high enough to frighten these animals from their foraging and breeding areas into less optimal habitats, reducing foraging efficiency. Poaching, spotlighting and general harassment may cause further pressure on herds. Deaths may result from collisions.

Mohave Ground Squirrel. This is an officially listed species, categorized by the California Dept. of Fish and Game as "rare." It is confined to the western Mojave desert and has a geographic range that extends from immediately south of Owens Lake/Olancha south into the Antelope Valley, and east generally to Searles Valley and the vicinity of Ft. Irwin in the north, to Apple Valley in the south. Approximately 50% of the geographic range is in private holdings and much has severely deteriorated or is no longer suitable for Mohave ground squirrels.

Off-road vehicle activity can be expected to deteriorate the habitat and to be responsible for extirpations both local and widespread, within 5 to 20 years. Off-road activity affects the ground squirrel and its habitat by: 1) direct mortality from vehicles; 2) crushing vegetation used for cover and forage; 3) crushing burrows; and 4) through noise, which is likely to cause deafening, resulting in behavioral changes and increased susceptibility to predation. The studies by Bury et al. (1977) and Byrne (1973), have amply demonstrated impacts of ORVs in the western and west-central Mojave on small vertebrates, in moderately used, intensively used and pit areas. Bury et al. (1977) found that vertebrate numbers were decreased by 55% and 20% in heavily used and pit areas, respectively, and biomass by 23% and 17%. Although there is little data available for ORVs on Mohave ground squirrels, we can assume similar patterns to that found for the Bury et al. (1977) study. Further, Byrne (1973) noted with regard to Dove Springs Canyon (where the squirrel occurs in relatively undisturbed habitat) "judging by the results of the... trapping, this squirrel would not continue to survive in this area if damage became more extensive." Since the time that Byrne (1973) undertook the Dove Springs study, the habitat damage became more extensive, a pattern that is typical of ORV open areas. The gradual growth of intensively disturbed areas in Dove Springs Canyon has been documented by Webb (1978).

Upland Game. Based on studies of ORV impacts on avifauna (Bury et al. 1977, Luckenbach 1978, Weinstein 1979) one might expect ORVs to have serious impacts on upland game. ORVs would: 1) damage vegetation used for forage, cover and nesting sites; 2) crush or otherwise damage nests; 3) disturb birds through the presence of vehicles and noise; and 4) ultimately destroy habitat. According to California Department of Fish and Game biologists (R. Reser, etc.), the Rand Mountains once supported excellent populations of Chukar, Gambel's Quail, and Mourning Dove. Declines were noted beginning at the time of ORV use.

Burrowing Owl and Desert Kit Fox. These two species are considered "significant" species by BLM. The Burrowing Owl is on the Audubon Society's list of diminishing species (Blue List) and the desert kit fox is fully protected by California Dept. of Fish and Game Codes. Both suffer from moderate to intense ORV activity. Their population densities are naturally low and they rely on burrow or den systems for cover. They also are dependent on a good supply of rodents for food. ORV activity would have serious impacts on both the prey supply [see earlier references by Byrne (1973) and Bury et al. (1977)] and on burrows/dens. O'Farrell and Gilbertson (1979), in a 1978-1979 study of the desert kit fox in the vicinity of the Rand Open Area and Desert Tortoise Natural Area, noted the importance of natal dens to the kit fox and suggested that further studies should be done to determine if ORV activities can trigger cave-ins of dens and if harassment of occupied dens occurs through noise and vibrations of ORVs passing over them. They found that some foxes had died from cave-ins and two foxes were illegally shot in the Rand Open Area.

Dune Systems, Endemic Beetles, and Specialized Vertebrates. Sand dune systems are isolated habitats, essentially islands surrounded by areas of more common, wide-ranging habitat types. Because of their isolation, they often support unique floras and faunas that have evolved in response to the specialized sandy environment. Hardy and Andrews (1976) and Hardy et al. (1979) surveyed selected dune systems in the CDCA and found that many supported endemic beetles.

Off-road vehicle use on Algodones dune system can be expected to destroy the habitat for and to extirpate two very rare and endemic beetles, as well as any other rare and endemic arthropods. Hardy and Andrews (1976) summarize how use of vehicles on dune can adversely affect arthropods: 1) by destruction of host plants for those species which require living plant material on the dunes; 2) by destruction of plant material on the areas around the dunes, thus removing the source of wind-drifted vegetable matter; 3) by breaking up accumulations of dead vegetation either on or near the surface of the sand, thus exposing immature stages to unnatural environmental conditions; 4) by breaking up and mixing crustal layers or compacted sand, depriving burrow-forming animals of suitable substrate; and 5) by disruption of reproductive behavioral patterns of highly adapted species. Hardy and Andrews (1976) note that the endemic, sand-loving beetles would be exposed to one or more of the above factors, and face possible extinction or population decline if habitat destruction occurs. Bondello and Brattstrom (1979) undertook a special study on the effects of vehicle noise on another desert lizard, the Mojave fringe-toed lizard. They found that dune buggy sounds of 95dBA (100dBL) and a cumulative exposure time of 500 seconds severely imparied the hearing. This level of sound is equivalent to those actually monitored from dune buggies in the desert at distances of 50 meters from the sound source. Bondello and Brattstrom (1979) did not consider shallow burial of lizards in sand as an adequate escape from dune buggy noise. They also suggested that the importance of hearing to the lizards is probably related to prey acquisition and predator avoidance. Bury (1978) documented the effects of ORVs on sand dwelling lizards in the Algodones Dunes. He found significant differences in lizard density and biomass between ORV used and relatively undisturbed areas (1.6 lizards per ha vs. 15/ha, respectively).

The desert kangaroo rat (Dipodomys deserti) is a species of limited distribution and localized occurrence. It is found only in areas of windblown sand and is considered to be highly specialized. Bondello and Brattstrom (1976) state that this species is totally intolerant of disturbances caused by ORVs. ORVs cause destruction to habitat by caving in burrows and by reducing plants used for cover and forage, such as Indian rice grass and certain species of Atriplex. In addition, these investigators report that 500 sec of vehicle noise can damage the hearing, rendering the species vulnerable to predation from rattlesnakes and possibly from owls and kit fox. The findings of Bondello and Brattstrom (1979) can be extended to other species of rodents as well. All rodents living within the dune system or within 50 to 100 meters of vehicle use can be expected to experience some deafening, and a resultant increased susceptibility to predation. Other aspects of behavior are also likely to be moderately to severely affected (courtship, reproduction, territoriality, care of young, etc.).

Effects on Wildlife Resources Adjacent to Open Areas

ORV use in open areas will have deleterious impacts on unique and sensitive habitats and wildlife in adjacent areas. A prime example is the ORV activity in the Dove Springs Canyon Open Area and spillover into adjacent canyons of the eastern face of the Sierra Nevada. Webb (1978) noted a 15% increase in highly disturbed and disturbed habitats in Dove Springs Canyon between 1973 and 1976 and BLM wildlife staff members have noticed the growing damage in nearby Sierran Canyons during and since that time. Other examples of increased deterioration can be seen at Jawbone and Red Rock Canyons, near Shadow Mountain, in the Rand Mountains, and near Fremont Peak.

Effects of Designated Roads and Ways on Existing Roads and Ways on Wildlife

General Impacts

The precise impacts will vary greatly with the number and location of roads designated for motor vehicle use. In general, restricting access to any area benefits wildlife by preventing or greatly reducing the area suffering the deleterious impacts described under the existing roads and ways, and open area element components, and allowing previously disturbed areas to begin the slow recovery process. Wildlife populations and habitat will still be disrupted, degraded or destroyed along designated roads, near developed, undeveloped, or primitive camping areas, and around high intensity visitor use areas.

Specific wildlife rsources such as raptor eyries, washes, riparian areas, springs restricted habitats, or species with extremely limited distributions may be disturbed by the designation of a single road. The desert tortoise, Mojave ground squirrel, flat-tailed horned lizard, bighorn sheep and other more widely distributed wildlife resources could be seriously affected if the number of designated roads in appropriate habitat is too great.

Very few areas in the CDCA are currently managed for designated roads and trails. Therefore it is difficult to predict how well the public will react to these restrictions on motor vehicle use. If compliance is good or if BLM rangers are able to enforce these regulations, the designated roads and ways classification may be highly protective and therefore beneficial to wildife resources. However, if desert visitors do not readily comply with this management technique and if BLM rangers are not able to provide adequate protection, the impacts associated with this classification may be similar to those described under existing roads and ways and open areas.

Since roads will be designated after the Desert Plan is adopted, there will be an interim period of unknown duration for each area when lands placed under designated roads and ways will be open for use on all existing roads and ways. During this time wildlife resources falling within the designated roads and ways motor vehicle use classification will be subject to the same serious negative effects described under the existing roads and ways element component. The magnitude and extent of the habitat degraded and species affected will vary with length of this interim period and intensity of visitor use in a particular area. Allowing unrestricted use of all existing roads and trails for too long a period could permit habitat quality or wildlife populations to decline to a point where recovery to a natural state may become difficult if not impossible.

General Impacts of Existing Roads and Ways

Unrestricted motorized vehicle use of all existing roads and ways over large portions of the CDCA (Use 64.7%, Balanced 36.7%, Protection 5.0%, No Action 61.8%) will have serious negative effects on a large number of wildife resources, including officially listed species, proposed BLM sensitive species, and special wildlife areas (Refer to attached table). The mechanisms for these losses include:

1. direct or indirect mortality,
2. noise impacts,
3. disturbances during critical breeding periods,
4. fragmentation of habitat,
5. establishment of undesirable exotic plants on road shoulders and other disturbed areas,
6. cumulative effect of uses such as camping, shooting, collecting, etc. over large areas facilitated by easy access, and
7. destruction and degradation of habitat through designation of selected washes as ways, and unrestricted vehicle use of

dune systems in this multiple use class.

Numerous studies on paved roads have shown that direct or indirect mortality can have a significant deleterious effect on wildlife populations. Similar types of impacts and trends are expected on dirt roads. Storm et al. (1976) estimated that red fox road kills accounted for 11% of the total annual mortality, with more juveniles than adults killed. Dickenson (1939) found seventy-five kangaroo rats trapped in a one mile section of paved highway which had recently been oiled. Welsh (1971) stated that 20% of the bighorn sheep deaths surveyed were the result of highway fatalities and 12% were from fence mortality. A 1966 nationwide survey of wildlife road fatalities lists 71,073 deer, 229 pronghorn, 108 elk, 37 bear and 4 mountain lion (Thompson 1966).

Highway mortality is by no means restricted to mammals. Robertson (1930) observed 104 road-killed birds along a nine mile section of paved road in one year. Hodson (1962) stated that birds were killed when feeding on insects or carrion, dust-bathing, taking grit, low flying or striking telephone wires. Reptiles and amphibians are particularly susceptible to highway mortality. Nicholson (1978) found a decrease in desert tortoise densities with decreasing distance from a paved highway; the roadside population apparently succumbing to highway mortality and collection for pets. The desert tortoise is a BLM sensitive species.

Recent studies have shown that the hearing abilities of birds (Marler et al. 1973), mammals (Bondello and Brattstrom 1979b), and reptiles (Bondello et al. 1979) can be permanently impaired by motorcycle and dune buggy noises. Hearing loss in the Mohave fringe-toed lizard and desert kangaroo rat occurred after a 500 second exposure (Bondello and Brattstrom 1979a, b). Ecological and behavioral evidence suggest that these hearing losses could lead to higher mortality among prey species due to decreased predator detection abilities. Bondello et al. (1979) found that Couch's spadefoot toads would emerge from burrows following 10 to 30 minutes of recorded motorcycle sounds in a laboratory experiment. If this occurs under field conditions, emerging toads would die from desiccation and starvation. The short duration of exposure indicates that the impacts on wildlife caused by high level noise could occur near roads, ways, washes, campgrounds, and activity areas in areas open to use of existing roads and ways. In addition to those species already studied, similar deleterious effects are also expected on other vertebrate species. Studies by Weinstein (1978) and Luckenbach (1978) indicate that most birds avoid areas intensely used by ORVs, reducing the changed of incurring hearing damages, but creating an area with lower breeding bird densities.

Disturbances during critical breeding periods can lead to reproductive failure. Raptors are generally more susceptible to disruptions in the breeding cycle during territory establishment and early incubation. Prairie Falcons may abandon an eyrie following a single short visit either before or during egg-laying (Fyfe and

Olendorff 1976). Haramata (1978) observed that reactions of several Prairie Falcons to motorcycles and vehicles during the breeding season in the western Mojave Desert. An incubating female stood up as a trail bike noise reached its maximum level and settled back down to incubate as the nose faded. The motorcycle was not visible to the observer one-half mile away. At another eyrie the male would often leave the vicinity of the eyrie and fly over vehicles passing on a trail 0.8 miles away. As the vehicle continued past, he would fly off or return to the eyrie. At a third eyrie, after abandoning her nest, the female would spend much of her time on the higher mountain slopes during weekends when vehicular traffic was heavy in the flats. These observations illustrate the potential for serious disturbances to raptor reproduction in areas of unrestricted use on existing roads and ways.

Roads may fragment habitat, preventing movement of wildlife. Oxley, Fenton, and Carmody (1974) suggested that highways serve as barriers between populations of small mammals. A four lane highway may be as effective a barrier between populations of small mammals as a body of water twice as wide. Roadways therefore serve to fragment healthy populations and split gene pools. Existing literature on this topic is sparse, with virtually nothing done on the effects of dirt roads.

Soil disturbances along road shoulders, ways and infrequently used roads facilitate the establishment of weeds such as Russian thistle (Wilshire 1977). Many of these plants are not readily utilized by wildlife. Russian thistle is neither a major nor a minor food item of the desert tortoise, and when the plants are extremely dense may actually prevent tortoise movement or block burrow openings (Berry and Nicholson 1979).

Allowing free-use of all existing roads and ways will permit easy access to large parts of the desert for numerous recreational activities. Habitat will be destroyed or degraded by a number of uses. Around frequently used campsites, soil will be compacted, vegetation will be crushed or cut for firewood, and wildlife will be generally disrupted. This is especially true in washes and other highly valuable wildlife habitat where campers park close to trees and springs (Luckenbach 1978, Weinstein 1978). Raptors may abandon their nests if campers or other recreationists spend too much time near an eyrie (Harmata et al. 1978). This is especially true early in the breeding cycle (Fyfe and Olendorff 1976). Desert bighorn sheep are also prone to disturbances by man (DeForge 1972, Graham 1971), and are especially sensitive near water sources (Jorgenson 1974).

Wildlife populations can be affected directly by collecting and indiscriminant shooting. Unrestricted access on existing roads and ways will spread these effects over large parts of the desert. All diurnal species are subject to collecting and shooting. Desert tortoises are frequently taken for pets and used as targets (Berry and Nicholson 1979); raptors (Murphy et al. 199, Boeker and Ray 1971, Seidensticker and Renolds 1971, Snow 1972, 1973, Snyder and Snyder

1975, Harmata et al. 1978) and kit foxes (O'Farrell and Gilbertson 1979) are common targets for shooters.

Desert sand dunes are among the most unique ecosystems in the CDCA. They are extremely limited in distribution and support a group of species highly specialized for survival on sandy substrates. Among these are numerous species of endemic dune beetles (Andrews et al. 1979), and three species of fringe-toed lizard (Stebbins 1966). Populations may be affected directly when vehicles crush animals on or in the sand (Photograph in The Enterprise - Feb. 19, 1979; Hardy and Andrews 1976). Andrews (1976) reported how caleopterous faunas may be indirectly affected:

1. by destruction of host plants for those species which require living plant material on the dunes,
2. by destruction of plant material on the areas around the dunes, thus removing the source of wind-drifted vegetable matter,
3. by breaking up accumulations of dead vegetation either on or near the surface of the sand, thus exposing immature stages to unnatural environmental conditions,
4. by breaking up and mixing of crustal layers or compacted sand, depriving burrow forming animals of suitable substrate,
5. by disruption of reproductive behavioral patterns of highly adapted species.

"It is felt that all sand restricted species may suffer the effects of at least one of the above factors. Species with wider distribution patterns would undoubtedly be in less trouble than others which may be restricted to only one dune. Widespread species would perhaps maintain population reservoirs on less accessible dunes, or on sandy areas of little interest to ORV users" (Hardy and Andrews 1976).

Desert washes are among the most productive in the CDCA. The large shrubs and trees provide added structural diversity; they also provide food, cover, nesting sites and perches for numerous species that don't occur in other desert habitats or are found at much lower densities away from wash habitat. Winter bird population surveys have shown 1.3 to 4.5 times more species and densities 1.4 to 13 times higher in washes than in other Colorado desert habitats (Tomoff 1975a, b, c; Johnston and Foster 1979; Daniels 1979a, b; Jehl 1979). Breeding bird densities in Colorado Desert washes ranged from approxiately one-thid to seventy-four times that in bajadas and mountain habitats with species diversities in washes one-half to seven times as high (Johnson and Foster 1979, Daniels and Boyd 1979a, b, Carlson 1979, Franzreb 1978). In the Mojave Desert, Remsen et al. (1976 a, b, c) found winter bird densities 50 to 60 times higher in a catclaw-rabbitbrush wash than in surrounding open desert communities.

Likewise, breeding and wintering bird densities and diversities are considerably higher in mesquite habitats found throughout the desert than in more typical desert scrub habitats (Evens 1979a, b; Stewart 1979a, b, c, d; Weinstein and Berry 1978a, b; Cardiff et al. 1978; Johnston and Foster 1979a, b; Foster and Johnston 1979a, b; Remsen et al. 1976 a, b; Kubik and Remsen 1977; Weinstein 1979a, b; Cardiff and Cardiff, 1979; Zembal et al. 1979a, b; Landry 1979). In addition to breeding and wintering birds, washes are also heavily used by migrants, support high densities of lizards and mammals, and are used by mule deer, quail and other game species.

Use of washes as ways for vehicular travel will have serious deleterious effects. A recent study by Luckenbach (1978) in the Mojave and Sonoran Deserts has shown significant reductions in the use of washes by breeding birds. Moderate ORV use reduced the number of breeding species by half. Heavy use in one study plot wiped out all breeding birds. In a comparison of two ironwood washes, the one not used by ORVs had 23 times as many breeding birds as the one frequented by vehicles. In the disturbed plot 90% of the breeding species were gone. In addition to the disturbances to nesting birds that can cause reproductive failure, the following factors are also involved:

1. Most desert bids breed in spring when ORV use also is highest.

2. The destruction of vegetation not only removes the cover for future nesters, but wipes out the food supply as well--the insect and arthropod populations they depend upon at nesting time.

3. ORV owners ride and camp around desert springs and keep birds, as well as other wildlife, from their water supplies.

Although not well documented, disturbances caused by the presence of people and the associated degradation or destruction of habitat should have similar effects on other classes of vertebrates.

Limiting vehicle use to existing roads and ways should limit habitat losses caused by off-road driving. However, as the Bakersfield District Manager has come to realize, "Covering three-and-one-half million acres of desert with three rangers is difficult and some areas will have to be ignored" (Boll 1979). In some instances the BLM has not been able to adequately protect areas closed to ORV use. Mary DeDecker (1979) documented the Bureau's inability to prevent dune buggy use at the Eureka Dunes, one of the most unique and fragile ecosystems in the CDCA, on a holiday weekend when high levels of visitor use can be anticipated. Many areas currently designated for use of existing roads and trails have become _de facto_ open areas with concomitant destruction of habitat and proliferation of roads (BLM-DPS Recreation Overlays, K. Berry pers. comm.). In November 1979, the BLM was unable to prevent a cross-country motorcycle race that violated restricted motor vehicle use areas along the entire course despite advance warning, a court injunction, and the presence of BLM rangers. If public compliance with vehicle use restrictions does not change or if the Bureau does not accomplish more effective enforcement, many of the areas designated for vehicle use on existing roads and trails will become or continue to be _de facto_ open areas with impacts much greater than those described above.

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APPENDIX 10b (iv)

Impacts of Energy and Utility Element on Wildlife

Methods Used in Determining Impacts

The process for determining the nature and intensity of impacts to wildlife resulting from land use designations in the energy and utilities element was begun with a review of available literature on direct and related impacts. The second step was to measure the areas of overlap between critical wildlife resources such as rare, endangered, sensitive or significant species and the components of the energy and utilities element such as transmission line corridors, powerplant sites, microwave towers, wind generation sites, geothermal resource areas and potential generation siting regions. Where specific information was not available concerning potential impacts to individual species or to desert wildlife communities and where information was available on the types of impacts but did not specify the quantitative effects of that impact, i.e. percent reduction of a species' population, professional judgement and personal knowledge from "on the ground" experience was used to predict impacts.

The extensive literature review provided information on methods of construction of utility facilities, land areas required, potential for irreversible environmental damage, methods of partial and complete environmental rehabilitation, and potential beneficial impacts.

All critical wildlife resources were mapped and overlaid with maps of the element components for each alternative. Areas of overlap for each resource and component were recorded and the number of critical wildlife resources affected was noted. These figures varied in each alternative since the number of options for each component differed according to the flexibility of each alternative.

Some components of the energy and utilities element were, of necessity, incompletely specified. For example, the number of options for transmission line corridors varies from fifteen routes in the Protection Alternative to twenty-eight routes in the Use Alternative. Since flexibility is also programmed into the power plant siting phase of the element, a corresponding flexibility was designed into the routes available for transmission lines. The text of the energy and utilities element (p. 99) displays a calculation for a hypothetical number of transmission lines necessary during the period 1980-2000 based on projected demand figures provided by the Joint Utilities Advisory Committee. The minimum number of needed corridors is then calculated, using the assumption that all of the new lines can be concentrated in this minimum number of corridors. Under the constraints of the element it is impossible to predict whether all utility companies will be able to concentrate their transmission lines, pipelines, aqueducts, etc. in that minimum number of corridors. More importantly, even if concentration is possible, it is not possible to know in advance which corridors will be used. Furthermore, there is no guarantee that the projected number of power plants and transmission lines will be constructed; there may be more or less. This is also true of the remaining components of the element, though generally to a lesser extent. Consequently, all wildlife resources which would be affected by any component of the utility element were evaluated as "potentially impacted" during the summarization of impacts and tabulated in Table PE-9 (p. 260).

Information from the literature review was used as a basis for ranking basic types of impact according to severity. Irreversible impacts such as habitat loss and fragmentation were considered to be most detrimental to wildlife. Others, such as noise and air pollution, disturbance of reproductive and other behaviors, introduction of competitive exotic species, and increased perch and eyrie sites for raptors, were ranked accordingly. Some of the information was also used to calculate on an average area of habitat loss and/or disturbance per mile of transmission line or pipeline. The final decision was to base impact evaluations on the figures in Table PE-9, despite the fact that they may be inflated, as these figures represent impacts from habitat loss and disturbance, the most severe and most easily quantified. The remaining impacts, listed above, were not quantified nor incorporated into the table, thus compensating to some extent for the inflated figures.

The No Action Alternative was assessed by considering the projected development for the period 1980-2000 as discussed in the text of the energy and utilities element. The No Action Alternative, due to its case-by-case system of evaluating permits for energy and utility development, is less restrictive than the Use Alternative. The Use Alternative has some provisions for regulated development; however, the potential for habitat loss is similar in the No Action Alternative to that in the Use Alternative, and the potential for habitat fragmentation is increased. Therefore, the No Action Alternative was assessed as highly negative, as was the Use Alternative.

Nature of Impacts: Utilities

The various components of the utilities element will involve impacts of several types: habitat loss; disturbance to normal behavior, noise pollution, air pollution, groundwater depletion and contamination, fragmentation of habitat and competition with introduced exotics.

Considering what is known of the effects of the impacts, habitat loss, due to its irreversibility, is evidently the most severe. Direct loss of habitat would occur as a result of construction of any permanent structures such as powerplants, microwave towers, and geothermal test wells. Estimates of areas required for construction are found in reports prepared by Southern California Edison (1974; 1977), U.S. Dept. of Interior (1975), USDI, Bureau of Land Management (1976). The latter report concluded that geothermal plant construction has its most severe impact on desert washes and other habitats of limited occurrence; washes and riparian areas are generally the most valuable to wildlife.

Habitat disturbance may result from a number of activities associated with energy development. Changes in structure and composition of the floral community will bring about similar changes in faunal communities. Short-to-long-term disturbances stem from reduction in canopy cover, density and diversity of both annual and perennial vegetation and decreased seedling germination (Romney 1976, Gibson 1973, Keefe and Berry 1973, Stebbins 1974, Davidson and Fox 1974).

Others have noted temporary devegetation and introduction of exotic species in construction areas for pipelines and transmission lines which may partially recover in time (Vasek 1975b, Minton 1968, Eadie 1953, Frenkel 1970). Soil compaction associated with root disturbance, degradation of soil biota and soil nutrients as well as increased wind and water erosion (USDI, BLM 1976; USDI, USGS 1978). Destruction of the seed bed and interference of the emergence of new shoots in seedling plants has also been noted (USDI, BLM 1979b). Some revegetation projects have been very unsuccessful (Brum 1979).

Graham (1971) discussed the increased access provided to the public by roads associated with utility installations. Trampling, degradation and hunting are more likely to occur in areas where they previously did not. Crushing of burrows and direct collisions with animals by off-road vehicles, noted by Luckenbach (1975), can be extrapolated to the use of construction equipment.

The normal behavior of animals can be disturbed both during and after construction. Interruptions occur during sensitive phases of reproductive behavior (Fyfe and Olendorff 1976, Hansen 1971, Sprock et al. 1967, Office of Naval Petroleum and Oil Shale Reserves 1976). Some bird species are susceptible to collision with or electrocution by powerlines (Crawford and Dunkeson 1974, Woodman personal communication). Pipelines, aqueducts and transmission lines may prove to be barriers to rodent movements (Eadie 1953, Cole 1978). Many populations may drop from overcrowding and abnormal intraspecific competition (USGS 1977).

Relatively little is known about the impacts from overuse and contamination of groundwater. Known sources of these problems are geothermal plants and road construction (Axtmann 1971, Layton and Erimak 1976, Parizak 1971, Lagenwerf and Specht 1970). The same is true of air pollution impacts; Swanson and Medli (1976) mention detrimental airborne byproducts from fossil fuel power plants. Noise levels from construction and operation of energy facilities vary widely and can present problems for some wildlife species. Perry (1971) reported levels of 46 to 61 dB accruing from daily operations of 500 kv transmission lines. Thompson (1979) inferred sound pressure levels of 60-90 dB for geothermal wells and power plants. Sound generation during construction of pipelines had aqueducts has been reported as 70-98 dB (Office of Naval Petroleum and Oil Shale Reserves 1976). Natural ambient sound levels in the desert range from 14 to 66 dB (Bondello and Brattstrom 1978). The responses of some wildlife species to abnormal noise levels are severe (Bondello and Brattstrom 1979a, 1979b, Hurley 1977, U.S. Environmental Protection Agency 1972) and include impaired hearing and stress-producing emergences by burrow-dwelling animals. Stebbins (1974) reported that some reptiles suffer hearing loss at sound levels of 60 dB. Habitat fragmentation from roads, pipelines, transmission lines and other energy developments can also impact wildlife, but has not been extensively studied. Preliminary information has indicated very negative impacts to desert tortoises (Gopherus agassizi) (Nicholson, In prep.). The net effect of these developments is to create island refuges of habitat which may or may not be large enough to support viable populations of some species, splitting gene pools and reducing local populations (Oxley, Fenton and Carmody 1974, Meneghin 1977).

Beneficial impacts may result from increased perches and eyrie sites for raptors on transmission line towers and wind generation towers (Rue 1957, Hannum, Anderson and Nelson 1975). Bikepaths, such as those built along the California aqueduct, or some other type of recreational pathway might be developed in conjunction with transmission corridors and reduce recreation pressure in more sensitive areas.

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APPENDIX 10b (v)

Mineral Exploration and Development Element on Wildlife

Methods of Determining Impacts

The potential effects of exploration and development of various mineral commodities (termed "locatables", "leasables" and "saleables") on wildlife species and habitats were determined using three techniques: (1) an examination of existing literature, some environmental statements; and policy; (2) field observations on a wide array of exploration techniques and developed areas, and (3) measurement of acreages involved. A review of existing literature and EAR's provided information concerning the methods of mineral extraction; equipment utilized, time frames, potential for irreversible environmental damage, potential for complete reclamation, and constraints placed on development as specified in environmental policy (Federal Land Policy and Management Act, P.L. 94-579). The multiple use class guidelines as described in the plan yielded further guidance.

Several assumptions regarding the impact of mineral exploration and development on wildlife resources were made prior to measurement. These are as follows:

1) mineral exploration, development and extraction on class C and L designated lands would be more closely monitored than on class M and I designated lands.

2) environmental damage on class C and L designated lands, by nature of the more restricted guidelines on development, would be less than on class M and I designated lands.

3) development of mineral resources has an equal probability of taking place anywhre within deposit boundaries.

4) the area of known mineral reserves may increase as additional, potentially profitable, mineral resources are discovered.

5) the potential for development throughout the area of a mineral resource exists, subject to a variety of variables, including: (1) class guideline restrictions; (2) environmental law and policy; (3) world market price as determined by supply-and-demand; (4) current and future extraction technologies, and (5) the domestic and international political climate.

6) mineral extraction, development and exploration will ave a similar effect on all wildlife resources and habitats known to occur within deposit boundary lines.

An assessment of the potential area of impact on wildlife from mineral exploration and development was determined using geologic resource maps. Maps of potential oil and gas leasing areas, deposits of "locatables" (tungsten, lead, gold, etc.) and "saleables" (gravel and clay deposits) were overlaid on the No Action, Balanced, Protection and Use Alternative maps. The total area of each mineral resource catagory present within classes C, L, M and I was then determined for the four plan alternatives. Overall ratings of impact on wildlife resources were given using two criteria: (1) the relative amounts of mineral resources located on use-oriented class M and I designated lands, and (2) the numbers of listed, sensitive and significant species, and unique or restricted habitats subject to potential loss or degradation. Analysis of individual species and habitats was accomplished by measuring the amounts of a particular wildlife resource present within use-oriented or protection-oriented designated lands in each plan alternative.

No time period for development of existing known mineral resources was utilized for the assessment analysis. The highly fluctuating price in several commodities and surging price of gas and oil may create a demand for development of areas within the CDCA which currently contain unprofitable reserves. Consequently, the exact amount of area of mineral extraction and development cannot be predicted within the twenty year time period of this plan.

Nature of Impacts

Habitat loss from mineral exploration and development mayr esult from a number of associated activities, including: (1) construction of roads, drilling platforms, open pits and shafts; (2) grading and trenching; (3) formation of damps and tailing pads; (4) leaching of toxic chemicals used during the extraction process; (5) removal of vegetation and (6) off-road vehicle use during exploration. Adverse impacts to wildlife population include soil compaction (U.S. Dept. of Interior, Bureau of Land Management 1979b), direct mortality (U.S. Dept. of Interior, Fish and Wildlife Service 1977), removal or collapsing of burrows (Lockenbach 1975), reduction in animal populations (U.S. Dept. of Interior, Bureau of Land Management 1973; Romney et al. 1976), decrease in vigor of habitats (Romney et al. 1979; Gibson 1973; Keefe and Bury 1973; Stebbins 1974), impairment of hearing ability (Stebbins 1974; Bondello 1976; Brattstrom and Bondello 1979; Harley 1977), poisoning from toxic chemicals left in sumps (Thompson 1979) and removal of vegetation during construction activities (Vasek et al. 1975). Other adverse effects resulting from surface mining activities include leaching of stored subsoil materials, topsoil removal, covering of wildlife habitat from mine spoils, increased erosion, displacement of mobile species, decrease in nutrient and energy flow to adjacent areas, destruction of less mobile species, destruction of food supplies and cover, and overcrowding and incrased competition for resorces (U.S. Dept. of Interior, Fish and Wildlife Service 1977). The specific effects of undue degradation of lands by hard rock mining on public lands have been discussed using examples by Shridas (1977). Deleterious effects to wildlife include increased erosion, contamination of water supplies, re-channeling of critical water supplies and destruction of vegetation.

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APPENDIX 10b (vi)

Livestock Grazing Element: Impacts to Wildlife

Methods of Determining Impacts

The first step in analyzing impacts was to determine important wildlife resources occurring in each allotment. Wildlife resource maps were used to identify federal and state-listed species, BLM sensitive species, proposed BLM sensitive species, significant species and special wildlife habitat areas within allotments. The amount of a species range or a special habitat area occurring within each allotment was determined by overlaying grazing allotment maps on wildlife resource maps and measuring the amount of overlap in square miles. These measurements were then converted to acres.

The types of impacts expected in the plan alternatives were determined on the basis of: (1) a comprehensive scientific literature review, (2) field observations by the wildlife staff, (3) letters and photographs from the general public, (4) personal communications from professional biologists outside the Bureau of Land Management and (5) best professional judgment.

Using the above sources of information, impacts were evaluated in each allotment on the basis of: class of livestock, season of use, range type, type of grazing system (i.e. Allotment Management Plan), condition and trend of the range, number and type of range improvements, turn out dates, watering and handling requirements, forage readiness requirements, maximum utilization levels and allocation of forage in relation to carrying capacity. Also taken into consideration was the class designation of each allotment, as management practices regarding wildlife resources vary by class. The "action" alternatives were evaluated using the No Action situation (at present time) as a baseline for comparison. The No Action Alternative was evaluated on the basis of effects expected if the current 1979 situation continues for the next 20 years.

The evaluations were based on the following assumptions:

1. Range condition and trend as stated in the livestock grazing element reflect the requirements for wildlife and are comparable across all allotments.

2. No Allotment Management Plans would be prepared or implemented in the No Action Alternative.

3. In the Action alternatives, prescribed management practices as well as specific management practices regarding the Desert Tortoise, Bighorn Sheep and riparian areas, as stated in the Livestock Grazing Element, would be initiated upon implementation of the Desert Plan and complete implementation would be achieved within 5 years.

4. In the Action alternatives, wild horse and burro numbers within allotments would be reduced within 5 years to proposed levels and maintained at those levels. In the No Action Alternative, wild horse and burro numbers would be maintained at 1979 levels.

5. Population estimates of wild horses and burros within allotments are reasonably accurate.

6. Carrying capacity of allotments are reasonably accurate.

The validity of some of these assumptions may be questionable, in which case the impact assessment would be expected to be more negative. The range condition and trend ratings for each allotment reflect an average, overall evaluation based on the requirements of livestock. The requirements of wildlife vary from those of livestock. In addition, those areas considered critical to wildlife (such as riparian areas) are often in poorer condition than the overall average rating of the remainder of the allotment.

The accuracy of the assumptions regarding wild horse and burros within allotments may be questionable. (See appendix on impacts of the wild horse and burro element on wildlife for discussion on population estimates and proposed reduction and maintenance of horse and burro numbers.) The effect of burros on wildlife within the allotments is much greater than that of livestock. Unlike livestock, burros and wild horses cannot be regulated by season of use or maximum utilization levels and their distribution within the allotment cannot be controlled. They also range into areas of the allotments which are unaccessible to livestock and where the more sensitive wildlife resources frequently occur.

The overall impact of each allotment on wildlife (i.e. the "dot chart" rating system of high negative, negative, no substantial impact, positive and high positive) for the No Action and No Grazing Alternatives was based on best professional evaluation, with all factors previously discussed being taken into consideration. The overall impact of each allotment to wildlife in the Use, Balanced, and Protection Alternatives was based on a mathematical model designed to insure consistency, as well as objectivity. The purpose in creating this model was to insure that each allotment in the Action Alternatives was evaluated equally, using the current 1979 situation as a baseline for comparison. The model was not used for the No Action and No Grazing Alternatives because they are not comparable actions and there are no class guidelines for the No Action Alternative.

Variables in the mathematical analysis were range condition and trend and percent of Multiple Use Classes C and L present in the allotment. These factors were selected for analysis, as it was felt they would best reflect changes expected in the action alternatives in relation to a no action (present-time) baseline. Although the condition and trend ratings reflect values for range and not wildlife, they do provide a basis for comparison. As such, these ratings were assumed to reflect the requirements for wildlife. The management practices within the Livestock Grazing Element regarding wildlife resources are most beneficial in classes C and L, therefore more positive impacts would be expected as the percentage of classes C and L increases.

Range condition ratings, as evaluated in the grazing element, were excellent, good, fair and poor. These ratings were assigned point values of 12, 9, 6 and 3, respectively. Range trend ratings were improving, stable and declining. They were assigned point values of 9, 6 and 3 respectively. The percent of classes C and L was taken from appendix tables for the grazing element. Point values were assigned as following: 95-100% C&L (7 points), 85-94% (6 points), 75-84% (5 points), 60-74% (4 points), 45-59% (3 points), 25-44% (2 points), 1-24% (1 point). The sum of these three variables was calculated for each allotment (Table 1). Some allotments have greater wildlife values than others. In order to account for this variable, points were subtracted from the scores in Table 1 based on the following set of criteria:

subtract 1 point for: 1 rare, threatened or endangered species, or
1-3 sensitive or proposed sensitive species and special areas, or
1-10 significant species present in an allotment.

subtract 2 points for: 2 rare, threatened or endangered species, or
4-6 sensitive or proposed sensitive species and special areas, or
>11 significant species present in an allotment.

subtract 3 points for: 3 rare, threatened or endangered species, or
7-10 sensitive or proposed sensitive species and special areas.

subtract 4 points for: 4 rare, threatened or endangered species, or
>10 sensitive or proposed sensitive species and special areas.

subtract 5 points for: >5 rare, threatened or endangered species.

The points subtracted for wildlife values are indicated in Table 1. Table 2 shows the final point value for each allotment. The predicted severity of impacts to wildlife resources, based on the final point scores in Table 2, were as follows: highly negative (6-11 points), negative (12-15 points), no substantial impacts (16-18 points), positive (19-22 points) and highly positive (23-28 points). The end points on this scale were based on minimum and maximum points possible. The minimum was equal to a declining range (3 points) in poor condition (3 points) with no class C or L (0 points) for a total of 6 points. The maximum was equal to an improving range (9 points) in excellent condition (12 points) with 100% class C and L (7 points) for a total of 28 points.

The overall impact of the grazing element in the action alternatives was determined by computing the mean of the values for all allotments in each alternative. The same scale as discussed above was used. The summary row on Table 2 displays the results. There was no significant difference between means for the Balanced and Protection Alternatives. Therefore the impact of the Balanced Alternative was evaluated to be the same as the Protection Alternative.

GRAZING SUMMARY -Table 1

	Sum of Range Condition and Trend and Class C & L - Evaluations			Points to Subtract for Wildlife Values
ALLOTMENT	USE	BALANCED	PROTECTION	
#1 Fishlake Valley	15	22	22	-0
#2 Bar 99	15	22	22	-0
#3 Deep Springs	12	19	19	-3
#4 Last Chance	15	19	19	-2
#5 Oasis Ranch	15	22	22	-3
#6 South Oasis	19	19	19	-1
#7 Darwin	12	19	19	-2
#8 Hunter Mtns.	19	19	19	-3
#9 Lacy McCloud	9	10	11	-4
#10 Olancha Common	15	15	22	-3
#11 Tunawee Common	13	14	16	-3
#12 Antelope Valley	12	12	12	-1
#13 Bissel	12	12	12	-3
#14 Cantil Common	15	20	21	-4
#15 Monolith Cantil	15	15	22	-2
#16 Oak Creek	12	12	12	-1
#17 Rudnick Common	9	16	16	-6
#18 Warren	12	12	12	-1
#19 Walker Pass	16	16	16	-4
#20 Pahrump Valley	12	19	19	-2
#21 Hanson	16	22	22	-3
#22 Boron Sheep	15	15	15	-2
#23 Buckhorn Cyn.	12	12	19	-3

#24 Goldstone	15	15	15	-2
#25 Granite Mtns.	18	18	25	-2
#26 Gravel Hills	15	15	22	-3
#27 Harper Lake	15	17	22	-2
#28 Lava Mtns.	22	22	22	-3
#29 Pilot Knob	15	17	17	-4
#30 Shadow Mtn.	9	9	16	-2
#31 Spangler Hills	18	18	22	-3
#32 Stoddard Mtn.	15	15	22	-4
#33 Superior Valley	15	15	18	-2
#34 Valley Well	9	9	16	-0
#35 Newberry/Ord	13	19	19	-3
#36 Rattlesnake Cyn.	22	22	22	-1
#37 Whitewater Cyn.	25	25	25	-2
#38 Afton Cyn.	12	14	19	-2
#39 Clark Mtn.	13	19	19	-3
#40 Colton Hills	16	19	22	-3
#41 Crescent Peak	18	25	25	-2
#42 Cronese Lake	12	19	19	-1
#43 Granite Mtn.	14	19	19	-5
#44 Gold Valley	18	25	25	-2
#45 Horsethief Spgs.	13	16	18	-3
#46 Kessler Spgs.	19	25	25	-3
#47 Lanfair Vly.	16	20	22	-4
#48 Piute Valley	15	22	22	-2
#49 Round Valley	6	13	8	-2

#50 Valley View	15	20	22	-3
#51 Valley Wells	15	17	22	-2
#52 Ford Dry Lake	15	15	22	-2
#53 Jean Lake	15	21	22	-1
#54 Lazy Daisy	15	22	22	-2
#55 "Sheep Driveway"	12	12	12	-2

Table 2: Impacts of the Livestock Grazing Element on Wildlife by Grazing Allotment/Alternative

Allotment	No Action Alternative	Protection Alternative	Balanced Alternative	Use Alternative	No Grazing Alternative
1) Fishlake Valley	◑	⦶ 22	⦶ 22	◑ 15	⊕
2) Bar 99	◑	⦶ 22	⦶ 22	◑ 15	⊕
3) Deep Springs	●	○ 16	○ 16	● 9	⦶
4) Last Chance	●	○ 17	○ 17	◑ 13	⦶
5) Oasis Ranch	●	⦶ 19	⦶ 19	◑ 12	⊕
6) South Oasis	●	○ 18	○ 18	⦶ 18	⦶
7) Darwin	●	○ 17	○ 17	● 10	⊕
8) Hunter mountain	●	○ 16	○ 16	○ 16	⦶
9) Lacey-Cactus-McCloud	●	● 7	● 6	● 5	⦶
10) Olancha Common	◑	⦶ 19	◑ 12	◑ 12	⊕
11) Tunawee Common	●	◑ 13	● 11	● 10	⦶
12) Antelope Valley	●	● 11	● 11	● 11	⊕
13) Bissel	●	● 9	● 7	● 9	⊕
14) Cantil Common	●	○ 7	○ 16	● 11	⊕
15) Monolith Cantil	●	⦶ 20	◑ 13	◑ 13	⊕
16) Oak Creek	●	● 11	● 11	● 11	⊕
17) Rudnick Common	●	● 10	● 10	● 3	⊕
18) Warren	●	● 11	● 11	● 11	⊕
19) Walker Pass	●	◑ 12	◑ 12	◑ 12	⊕
20) Pahrump Valley	●	○ 17	○ 17	● 10	⊕
21) Hanson	●	⦶ 19	⦶ 19	◑ 13	⊕
22) Boron Sheep	●	◑ 13	◑ 13	◑ 13	⊕
23) Buckhorn Canyon	●	○ 16	● 7	● 9	⊕
24) Goldstone	●	◑ 13	◑ 13	◑ 13	⊕
25) Granite Mountains	⊕	○ 23	○ 16	○ 14	⊕
26) Gravel Hills	●	⦶ 11	◑ 12	◑ 12	⊕
27) Harper Lake	●	⦶ 20	◑ 15	◑ 13	⊕

(continued next page)

Table 2 (cont.)

	N A	Prot.	Bal.	Use	No Gr.
28) Lava Mountains	●	⦶ 14	⦶ 9	⦶ 19	⊕
29) Pilot Knob	●	◑ 13	◑ 13	● 11	⊕
30) Shadow Mountains	●	◑ 14	● 7	● 7	⊕
31) Stangler Hills	●	⦶ 19	◑ 15	◑ 15	⊕
32) Stoddard Mountain	●	○ 18	● 11	● 11	⊕
33) Superior Valley	●	○ 16	◑ 13	◑ 13	⊕
34) Valley Well	●	○ 16	● 9	● 9	⊕
35) Newberry Ord	●	○ 16	○ 16	● 10	⦶
36) Rattlesnake Canyon	●	⦶ 21	⦶ 21	⦶ 21	⊕
37) Whitewater Canyon	●	⊕ 23	⊕ 23	⊕ 23	⦶
38) Afton Canyon	●	○ 17	◑ 12	● 10 *.	⊕
39) Clark Mountain	●	○ 16	○ 16	● 10	⦶
40) Colton Hills	●	⦶ 19	○ 16	◑ 13	⦶
41) Crescent Peak	●	⊕ 23	⊕ 23	○ 16	⊕
42) Cronese Lake	●	○ 18	○ 18	● 11	⊕
43) Granite Mountain	●	◑ 14	◑ 14	● 9	⦶
44) Gold Valley	●	⊕ 23	⊕ 23	○ 16	⦶
45) Horsethief Springs	●	◑ 15	◑ 13	● 10	⊕
46) Kessler Springs	●	⦶ 22	⦶ 22	○ 16	⦶
47) Lanfair Valley	●	○ 13	○ 16	◑ 12	⦶
48) Piute Valley	●	⦶ 20	⦶ 20	◑ 13	⊕
49) Round Valley	●	● 6	● 11	● 4	⊕
50) Valley View	●	⦶ 19	○ 17	◑ 12	⦶
51) Valley Wells	●	⦶ 20	◑ 15	◑ 13	⦶
52) Ford Dry Lake	●	⦶ 20	◑ 13	◑ 13	⊕
53) Jean Lake	●	⦶ 21	⦶ 20	○ 17	⊕
54) Lazy Daisy	●	⦶ 20	⦶ 20	◑ 3	⦶
55) Sheep Driveway	●	● 10	● 10	● 10.	⊕

	Prot.	Bal.	Use
$\bar{x}$ =	16.8	15	12
var =	17.2	18	12.9
SD =	4.2	4.3	3.6
2SE =	1.13	1.16	.97 (SE=.48)

Nature of Impacts

The largest numbers of livestock occurred in the western United States during the first part of this century when the sheep industry was at its maximum. However, forage demand for western livestock today is at an alltime high as the result of growth in cattle numbers (Wagner 1978).

Livestock grazing within reasonable limits is compatible with the existence of many wildlife species. However, grazing does cause a shift in plant species composition (Weaver and Clements 1938, Blydenstein et al. 1957, Ellison 1960, Wagner 1978 and others). As vegetation composition is altered through grazing, wildlife may be affected by even subtle changes while range condition remains favorable for livestock (Wagner 1978). Consequently, a change in animal species composition can be expected as a result of vegetative changes due to grazing. Generally, those species with limited distributions and specialized habitat requirements are likely to be most adversely affected. The impact of livestock grazing on wildlife and wildlife habitat varies, depending on a number of factors, some of which include: class of livestock, season and intensity of use, type of grazing system, location and number of range improvements, condition and trend of range and length and history of livestock use. Impacts also vary depending on the group of animal or habitat type:

Invertebrates

Recent studies (Morris 1967, 1968, 1969, 1971) indicate that insects are more abundant in ungrazed areas than in adjacent grazed areas. Invertebrates comprise an important food source for many species of amphibians, reptiles, birds and small mammals. Thus any reduction in invertebrates would secondarily effect those vertebrate species relying on invertebrate food sources.

Amphibians and Reptiles

Impacts to amphibians and reptiles include trampling of individuals and burrows, loss of cover and reduction in insect prey items. Certain species of reptiles are found to increase while others decrease as a result of vegetative change (Jones 1979; Boyer, in prep.). Thus animal species composition can be expected to change as a result of vegetative change due to grazing.

In a study on the effects of sheep grazing on lizards in the western Mohave Desert, Busack and Bury (1974) found that an ungrazed creosote community had twice the number of lizards and 3.7 times the biomass of comparable grazed areas. The negative effect of grazing was attributed to loss of cover, reduction in invertebrate food sources, disturbance of social structure and casualties.

Livestock grazing may have detrimental effects on tortoise populations (Woodbury and Hardy 1948; Coombs 1974, 1977; Berry 1978). Berry (1978) has presented circumstantial evidence that livestock grazing can have a deleterious effect on desert tortoises by reducing forage, trampling shelter and cover sites, and in some instances, trampling tortoises. She noted specificially that livestock grazing can 1) reduce the food supply and slow growth, increasing the time for individuals to reach maturity, 2) reduce the number of clutches produced by adult females, 3) alter age class composition of a population to a situation where adults predominate, eventually reducing density, 4) contribute to an imbalanced sex ratio favoring males, and 5) increase mortality rates in adult female and small tortoises through forage loss and trampling. Adult females and small tortoises are more susceptible than other groups because of small home ranges, fragile shells, and high energy commitments. Studies have been undertaken throughout the Southwest on desert tortoises; there are indications of widespread declines, with grazing being a contributing factor.

Birds

Livestock grazing affects bird populations through loss of cover and nesting sites, reduction in insect prey items and competition for forage. As with other groups of animals, vegetation changes induced by livestock grazing also can be expected to alter avian species composition. In northeastern Arizona Monson (1941) found the effect of increased food and cover on ungrazed plots more than doubled the bird populations. Populations of Dickcissels and Bell's Vireos were 50 percent lower on grazed than on ungrazed lands in Oklahoma (Overmire 1963). Smith (1940) also found that birds disappeared from overgrazed lands in Oklahoma. A number of studies have demonstrated higher reproductive success and increased production of waterfowl on ungrazed plots or those managed by rest rotation (Bue et al. 1952, Kirsch 1969, Gjersing 1975, Mundinger 1976 and others). Important food plants for Gambel's Quail and Mearn's Quail in Arizona have been removed by livestock grazing, according to Gorsuch (1934) and Gallizioli (1976). Reproductive efforts of wild turkeys in Arizona are less successful in grazed areas, apparently because of reduced nesting cover (Gallizioli 1976). Removal of cover for Scaled Quail due to grazing has been observed in west Texas (Wallmo 1956). Buttery and Shields (1975), in a paper which reviewed a number of studies, stated "effects of grazing most often depend on its intensity and localization. High intensity grazing profoundly alters breeding avifaunas from the natural state, generally in the direction of decreased species numbers and complexity." However, light to moderate grazing would probably not be detrimental to most rangeland birds (Buttery and Shields 1975, Weins and Dyer 1975).

The effects of grazing on predatory birds such as the Golden Eagle and Prairie Falcon which require open foraging habitat may vary with the complex interactions between vegetation structure and composition and prey availability. Overgrazing to the point where prey species decline and plants providing perch sites are not perpetuated can be extremely detrimental to raptors. In some habitats not previously damaged by overgrazing, light to heavy grazing may increase some rodent populations (see small mammal section) and therefore be beneficial to raptors. Not only may prey items be more abundant in some grazed areas, but vulnerability to predation is also presumably higher (Snyder and Snyder 1973). However, Olendorff and Stoddard (1973) found that small mammals in a short grass prairie were generally most abundant in ungrazed or lightly grazed habitat. In general, the majority of CDCA rangelands have been moderately to heavily grazed, with some areas subject to periodic overgrazing (P. Ernst, per. comm.). Signs of recent overgrazing (within the last 5 years) are visible in localized areas of the eastern Mohave Desert, western Antelope Valley and the eastern slopes of the Sierra Nevadas (H. Johnson, per. comm.).

Small Mammals

A change in mammal species composition can be expected as a result of vegetative changes due to grazing. Vegetative shifts may be beneficial for species such as the black-tailed jackrabbit and Merriam's kangaroo rat which appear to require more open habitat systems. Other species such as cottontail rabbits, harvest mice and pocket mice which require a more dense overstory of vegetation are found to decrease in response to grazing pressure (Phillips 1936, Stoddard and Smith 1955, Reynolds 1958, Ellison 1960, Black and Frischknecht 1971, Martin 1975, Dick-Peddie 1976 and others).

Livestock grazing may affect small mammals through trampling of burrows and individuals, loss of cover, reduction in insect prey items and competition for forage.

Large Ungulates

A number of biologists have attributed bighorn sheep population declines to competition with domestic livestock. Severe overgrazing by and competition for forage with livestock is considered to be the single most important factor affecting the disappearance of bighorn from northern and central Nevada and in localized areas of southern Nevada and competition with livestock continues to be a major factor in limiting bighorn populations (McQuivery 1978). The disappearance of bighorn in many ranges of Arizona seems to coincide closely with the spread of cattle in those areas and there is presently no range in Arizona where there is a thriving population of bighorn and where cattle are being grazed (Gallizioli 1976). In some areas of the California deserts, bighorn range may have been reduced due to utilization by cattle (R. Weaver, Calif. Dept. Fish and Game, per. comm.). Competition between bighorn and livestock is not limited to forage or cover, but may also include space. Bighorn appear to be intolerant of the presence of domestic livestock (Russo 1956, Wilson 1968, Albrechtsen and Reese 1970, Dean 1975, Gallizioli 1976).

Competition between livestock and bighorn has been documented in Idaho (Morgan 1971), Colorado (Packard 1946, Bear and Jones 1973), Wyoming (Crump 1971), Texas (Davis and Taylor 1939), New Mexico (Gordon 1957, Sands 1964), Utah (Wilson 1968, Dean 1975), Arizona (Russo 1956, Gallizioli 1976) and Nevada (Albrechtsen and Reese 1970, Ferrier and Bradley 1970, McQuivery 1978).

Mule deer and livestock may compete for desirable browse species. Short (1977) found that deer in southern Arizona grasslands did not eat appreciable amounts of grass, the preferred forage of cattle. However, cattle did consume browse species utilized by deer. Competition could be expected to be most severe during years of low rainfall, in seasons when browse availability is limited or where the range is in fair or poor condition. Light to moderate livestock grazing is usually not detrimental to mule deer and competition is usually low on ranges which are in good condition (Hill 1956, Truett 1972, Martin 1975). However, on overgrazed ranges, cattle will eat browse species preferred by deer (Gallizioli 1976).

Wash Habitats

Relatively high soil moisture levels along desert washes generally support better developed and more productive vegetation than adjacent bajadas and lowland habitat. Plant cover is generally higher, shrubs are bigger and trees are often present. This increased structural diversity and habitat richness generally supports a much greater diversity and density of wildlife than more common desert scrub habitats. Excellent data exist illustrating the importance of this habitat to birds. Food, cover, nesting sites and perches in wash habitats support a number of species that do not occur in other desert habitats or are found at much lower densities. In the eastern Mojave Desert, Remsen et al. (1976a, b, c) found wintering bird densities 50-60 times higher and species diversity 4-8 times higher in a catclaw-rabbitbrush wash than in surrounding open desert communities. Mesquite thickets associated with washes found throughout the desert are also highly productive. Stewart (1979a, b, c, d) found 50 percent more breeding bird species and three times as many wintering species in the mesquite thickets at Salt Lake, Inyo County, California, than he did in a sagebrush community approximately twelve miles north. In addition to more species, breeding bird densities were nearly four times higher. Similar trends are also found when Stewart's results are compared to studies in a creosote bush scrub community in Kern County near the Desert Tortoise Natural Area (Landry 1978, 1979). In the southern deserts, winter bird population surveys have shown 1.3 to 4.5 times more species and densities 1.4 to 13 times higher in washes than in other Colorado desert habitats (Tomoff 1975a, b, c, Johnston and Foster 1979, Daniels 1979a, b, Jehl 1979). Breeding bird densities in Colorado Desert washes ranged from approximately one-third to seventy-four times that in bajadas and mountain habitats with species diversities in washes one-half to seven times as high (Johnson and Foster 1979, Daniels and Boyd 1979a, b, Carlson 1979, Franzreb 1978). In addition to breeding and wintering birds, washes are also heavily used by migrants. They support high densities of lizards and mammals and are important to mule deer, quail and other game species. Fusari (1977) sampled small rodents at ten sites in the Colorado Desert and trapped more animals in a wash habitat than any other.

The more lush vegetation of washes also make them favorite areas for livestock. Grazing pressure in washes can be much more intense than in surrounding habitats. Seedling shrubs and trees may be eaten before they can become established. Young trees and shrubs may be repeatedly grazed, stunting growth. Less palatable species such as cat-claw (_Acacia greggii_) may proliferate at the expense of other shrubs. Livestock entering and leaving the wash can trample and collapse the banks causing increased erosion and undercutting vegetation. The net result is commonly a decrease on plant diversity and reduction in the number of large shrubs and trees. As a result, the wash may become structurally more similar to more common desert scrub habitats and support fewer species of wildlife at considerably lower overall densities.

Riparian Habitats

Riparian habitats, including marshes, cottonwood-willow vegetation and mesquite thickets, are the CDCA habitat types most important to wildlife. Nine of ten officially listed species, thirteen of twenty-two proposed BLM sensitive vertebrate species, twelve of twenty-eight significant vertebrate species, as well as most game animals occurring in the CDCA rely on riparian habitats during all or part of their life-cycle.

Riparian habitats are extremely important to birds. Many species do not occur in the drier habitats, while others can be found outside riparian zones, but at much lower densities. Winter bird populations in cottonwood-willow habitat at Fort Piute are nearly 100 times as dense as in surrounding desert habitats (Kubik and Remsen 1977a&b, Remsen 1977). Nine-hundred Mourning Doves have been counted there in a single morning and as many as 200 pairs have nested in the woodland itself (Remsen unpubl. field notes). Breeding and wintering bird studies in riparian thickets at Afton Canyon supported greater numbers of species than any other desert habitat (Mack 1979a). Riparian habitat at Corn Spring supported thirty-one species of wintering birds at concentrations of nearly 1200 birds/100 acres, a figure surpassed only by the Chuckwalla Valley Dune thicket, a riparian/wash habitat type (Mack 1979b).

Breeding bird densities in mesquite thicket/salt bush/salt cedar communities are up to 50 times higher than drier scrub habitats and supports up to 10 times as many species (Evens 1979a, Stewart 1979a, b, c, Weinstein and Berry 1978a, b, Cardiff et al. 1978, Johnston and Foster 1979a, Foster and Johnston 1979a, Remsen et al. 1976, Kubik and Remsen 1977). Winter bird populations have 1 1/2 to 13 times as many species at densities 1 1/2 to nine times that of bajada and valley habitats (Evens 1979b, Stewart 1979d, Weinstein 1979a, b, Cardiff and Cardiff, 1979, Zembal et al. 1979a, b, Landry 1979, Johnston and Foster 1979b, Foster and Johnston 1979b).

With one or two exceptions, all amphibians occurring in the California desert are restricted to riparian situations. This includes isolated populations of coastal forms such as the Pacific slender salamander and the entire range of two newly described salamanders. The state-listed rare black toad is known is found only in a few springs in Deep Springs Valley, Inyo County.

Free surface water found in riparian areas is essential for many mammal species, including mule deer and bighorn sheep. Species such as the Amargosa vole and Mohave vole are known only from marsh habitats in riparian areas.

The water and lush vegetation of riparian habitats are heavily used by livestock as well as wildlife. Stocking rates on public lands are based on animal unit months (AUMs) with the number of animals permitted in an allotment being determined by its total area. However, cattle do not distribute themselves evenly over all terrain, preferring moderate topography and ready access to water (Wagner 1978). Ames (1977), Kennedy (1977) and many others have shown that cattle concentrate in riparian areas. This results in heavy grazing of riparian vegetation, overuse of stream bank plants and erosion of stream banks. Valuable wildlife cover, nesting and foraging habitat can be eaten and trampled. Seedling and sapling trees are eaten or trampled, preventing replacement of older trees. Duff (in press) found that riparian vegetation declined 35 percent in six weeks when cattle were introduced to an area that had not been grazed for four years. Soil compaction can prevent seedling establishment and increase run-off. Cattle entering and leaving riparian areas along a streambank can cause them to collapse, changing stream flow characteristics, increasing erosion and eventually undercutting trees and shrubs.

The general effect of grazing on riparian habitats and wildlife is negative. This is highly significant as riparian areas are the most productive desert habitats and support the majority of listed species, proposed BLM sensitive species, and significant species.

Range improvements

Livestock water developments which increase the amount of water available or provide it where there was none can be beneficial. Probably the most detrimental effect of water development of any kind is the overuse and resulting deterioration of the area around the water source. The vicinity around the water development becomes a loafing area for livestock, causing damage to vegetation and soil, and destroying ground cover and nesting habitats (Buttery and Shields 1975). Heavy grazing and trampling can occur within several hundred yards to a mile of the water source. Additional effects include tapping and drying up of fragile water sources and permitting livestock use in previously undisturbed areas through the use of pipelines. Springs supported by small aquifers may become dry if flow after development exceeds recharge rates. This eventually could lead to loss of riparian habitat.

Fences probably have little effect on bird, small mammal or reptile populations. They can provide hunting perches for raptors, flycatchers and shrikes and nesting areas for other birds (Buttery and Shields 1975). Fences can potentially cause injuries to bighorn (Helvie 1971) and deer. Bighorn are found in relatively low population levels levels in many mountain ranges and corridors between mountain ranges allow populations to move to other ranges when conditions become less favorable, such as an extended drought. Fences can restrict, if not eliminate, these types of movements, as well as seasonal migration.

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APPENDIX 10 b (vii)

Impacts of the Wilderness Element on Wildlife

Methods of Determining Impacts

The positive and negative effects of wilderness classification on wildlife resources and habitats were assessed through a review of existing literature, federal law and land class guideline restrictions. The literature review provided information on the role of wilderness management to wildlife resources and wildlife-related problems. Other sources contributed information on the wilderness inventory process, the criteria for wilderness classification, numbers of proposed wilderness areas and their sizes under plan alternatives, and the kinds of impacts and their effects on wildlife resources. The Federal Land Policy and Management Act (Public Law 94-579) and Wilderness Act (Public Law 88-577) provided statements of policy, definitions of terminology and constraints on certain uses. Review of multiple use guideline restrictions for wilderness designated lands provided specific information concerning constraints placed on activities each as livestock grazing, motorized vehicle use, utility construction, various recreational pursuits, mineral exploration and development, and habitat manipulation.

To determine the specific effects of wilderness designation on wildlife resources under each proposed alternative, the number and kinds of state and federally listed, sensitive and significant wildlife species, as well as unique and representative habitats that occurred within designated wilderness areas, were determined by overlaying wildlife resource maps on maps with proposed Wilderness Study Areas. Measurements were then made of the amount and kinds of wildlife sources in each Wilderness class designated Area.

Although wilderness designations are expected to have positive impacts on wildlife resources through preservation of habitats and strict constraints on development, impact will vary, depending upon such factors as the number and size of wilderness areas, locating the number of wildlife resources and unique habitats, and classification of adjacent leads. The overall impact rating assigned each proposed plan alternative was dependent upon these factors.

Nature of Impacts

Wilderness designated areas will have a positive effect on their constituent wildlife population through restrictions mandated by policy guidelines on consumptive uses such as motorized vehicle access, livestock grazing, feral horse and burro herd, mineral exploration and development, utility construction and agricultural use. Although the impact of wilderness designation on wildlife resources is, in general, highly positive, negative impacts may occur from restrictions on development-related projects such as spring stablization, removal of exotic vegetation, or trucking water supplies into remote areas to refill critical watering tanks.

The populations and habitits located within wilderness designated lands in turn will serve several positive functions, including: (1) providing "core" populations of representative plant and wildlife species, (2) preserving species and habitats of limited distribution and highly susceptible to human desturbance; (3) serving as a gauge with which to monitor changes in adjacent areas exposed to modification or alteration by human-related activities; (4) serving as a reservoir of genetic variability for future needs; (5) providing enjoyment to recreationists using these areas; (6) providing essential breeding habitat for seasonal use for some populations (lambing grounds, nesting sites, etc.) (Henden, Stanley and Lucus 1978).

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APPENDIX 10b viii

Impacts of Wild Horse and Burro Element on Wildlife

Methods of Determining Impacts

Wild horses and burros, especially burros, are distributed widely over the CDCA. Currently numbers of these animals are at high levels and are directly and indirectly impacting wildlife populations in many areas. Numbers apparently have increased since the passage of Public Law 92-195 which protect these animals from a variety of man-induced population manipulations. Prior to passage of the law, animals were removed with little or no planning, that is there was no management of populations.

ASSUMPTIONS:

The Wild Horse and Burro Element of the Desert Plan was evaluated on the basis of a number of major assumptions. These assumptions are:

1. Population estimates of wild horses and burros are reasonably accurate.
2. Wild horse and burro recruitment rates (birth and immigrations) - (deaths and emigrations), which were not addressed in the Wild Horse and Burro Element, approach 15% per year. Field data indicated that population recruitment rates vary between 10 and 30 percent per year. (Carothers, pers. comm.; Ohmart, pers. comm.; Seegmiller, pers. comm.), so the use of 15 percent is conservative.
3. Populations under the No Action Alternative will be held to 1979 levels, as specified in the Wild Horse and Burro Element. Costs were not considered in the Element, but probably exceed current funding levels.
4. Populations under the Action Alternatives will be reduced to and maintained at projected levels. The Wild Horse and Burro Element does not specify when control would be initiated or when reduction to specified levels will be completed. For the purposes of the wildlife impact analysis it was assumed that control measures would be initiated upon implementation of the Desert Plan (October, 1980) and that reduction to the population levels specified in the element would be reached within five years (October, 1985).
5. Range conditions and trends as displayed by the Wild Horse and Burro Element reflect the requirements for wildlife and are comparable across all wild horse and burro management areas.

The above assumptions are based on what was discussed in the Wild Horse and Burro Element. The validity of these assumptions is questionable. If any of the assumptions are invalid, the relative severity of impacts would be greater than the analysis indicates. Based on costs, past BLM management practices and difficulties in attaining the goals stated in the Wild Horse and Burro Element, a number of predictions can be made relative to the validity of the assumptions.

The accuracy of current populations estimate is questionable. Estimation of burro numbers without marking and recapturing animals does not provide an accurate estimation of numbers (S. Carothers, per. comm; R.O. Ohmart, pers. comm; R. F. Seegmiller, pers. comm.) and may significantly underestimate the size of burro populations. Without accurate baseline information, aerial monitoring techniques might be highly unreliable. If burro populations are greater than estimated, the cost to reduce burro numbers to their specified levels would increase; concomitantly the probability that those goals for reduction would be reached will decrease and the severity of impacts on wildlife would be greater than the analysis indicates.

Recruitment rates vary among populations; as populations increase, recruitment rates would eventually decline. Whereas, as populations decrease under control, recruitment rates would probably increase. Thus, recruitment rates will probably be higher after horse and burro numbers are reduced to the specified levels.

Projected reductions in horse and burro numbers from 1979 estimates, No Action - 0 percent, Protection - 56 percent, Balanced - 58 percent and Use - 62 percent, are large reductions and would reduce wild horse and burro impacts on the range. It was assumed that reductions would reach specified levels within five years of plan implementation. Within these five years, the range would decline even farther. Reduction would probably not substantially improve sensitive areas such as riparian areas and water sources. Wild horses and burros require these areas for shade and water, hence even though reductions occur, excessive use of these areas would continue. Impacts on bighorn sheep would not decline appreciably; forage and water resources would still receive severe impacts.

Projected reductions in horses and burros range from 56 percent under the Protection Alternative to 62 percent under the Use Alternative. This is a difference of 572 horses and burros removed between the Protection and Use Alternative which averages (mean) about 15 animals per herd management area (37 herd management areas). A change of this magnitude, in most herd management areas, would not result in appreciable differences in impacts among the alternatives.

The Wild Horse and Burro Element specifies the number of animals which will be maintained within the herd management areas, but it does not estimate the amount of time necessary to meet those requirements. It will probably take about 10 years to reduce horses and burros to those levels; during this period horses and burros will continue to increase and degrade wildlife habitat further.

Range condition and trend information from the Wild Horse and Burro Element was collected using non-quantitative techniques by range conservationists. These assessments do not necessarily agree with assessments made by wildlife biologists on the same herd management areas. The differences in ratings occur largely because of the objectives of the rating systems. Range conservationists rate quality of range on the basis of what conditions are best for wild horses and burros whereas wildlife biologists rate quality of range on the basis of what conditions are best for wildlife. What may be good for wild horses or burros may not be good for wildlife. Range conservationists rated several herd management areas in better condition than did wildlife biologists. The ratings are averages of the condition of each herd management area; that is some parts of the management areas are in better condition and other parts are in poorer condition than the ratings indicate. Much of the most valuable wildlife habitat, such as riparian areas, is found in parts of the herd management areas heavily used by burros; such areas would probably have a lower condition rating than the herd management area overall.

The Wild Horse and Burro Element did not address topics which could invalidate several of the assumptions. These topics are:

1) initial cost for reducing horse and burro numbers and the annual expense of maintaining herds at specified levels. The expense of implementing this element for each alternative over 20 years will be high; an estimated 6.9 million dollars for No Action, 4.2 million dollars for Protection, 4.1 million dollars for Balanced and 4.0 million dollars for Use. The values and assumptions used to develop these estimates are:

    a) estimates were used for burros as approximately 92 percent wild horses and burro population are burros whereas 8 percent are horses

    b) estimates of populations are from Wild Horse and Burro Element (See comments regarding element assumptions above)

    c) cost estimates are based on 1978 costs and do not consider inflation. Costs used are $125 to capture each burro and $100 to maintain each animal until adoption (H. Wilson, pers. comm.). These costs do not include personnel or bookkeeping costs.

    d) recruitment of animals is about 15 percent per year (see comments regarding element assumptions above)

    e) numbers will be reduced to those specified in element immediatly (see comments regarding this topic below)

    f) numbers will be reduced to specified numbers every two years following initial reduction (see comments regarding this topic below)

    g) this analysis does not consider extra holding time before adoption when large numbers of burros are held after initial reductions.

2) prescribed intervals for reduction of burro herds to maintain

populations at specified levels. M. Hatchel (pers. comm.) a wild horse and burro specialist suggests that numbers will be reduced at two to three year intervals. Assuming 15 percent recruitment rates, the populations would have increased by 32 to 52 percent within a two to three year interval. This would impact the management areas more than the projected numbers indicate

3) the amount of time required/deadline for initial reductions. This could not be done immediately but would probably take 5 to 10 years to reach projected levels.

TECHNIQUES:

Potential impacts on wildlife species and areas were estimated by measuring the areas of overlap between specific wildlife resources and the wild horse and burro management areas. Measurements were made using square mile counters. Then the amount of a particular wildlife resource occuring in a particular herd management area was converted from square miles to acres.

The effects of wild horses and burros on wildlife resources in the CDCA were determined by applying published and unpublished information to each herd management area. Sources of information included: scientific literature, published and unpublished reports, experts in the field (S. Carothers, R.D. Ohmart, R.F. Seegmiller) etc. Several herd management areas were examined by wildlife staff members in the field. Some sites were examined yearly whereas others were visited only once or twice from 1970 to the present. Aerial photographs and transects of herd management areas were also examined.

The initial evaluation of the impacts of this element on wildlife attempts to address the impacts of each specific herd management area upon the wildlife within the management area. The wildlife staff did not have equal amounts of information for each herd management area therefore they could not evaluate in a consistent manner without examination of characteristics which were common to all herd management areas. To permit comparisons between herd management areas, a mathematical procedure was developed which compared each herd management areas on the basis of four variables: range condition, range trend, percent reduction of wild horse/burro numbers, and number of special wildlife species or areas within the management area. Range condition and trend were considered to be very important for predicting impacts. If the range is fair or poor and declining, a mere 60 percent reduction in horse and burro numbers over 20 years would probably not improve the range to levels where wildlife would be benefited to any great degree. Seventy percent of the concentration areas within herd management areas are in fair or poor condition and are declining. Reductions in burro numbers are also important as are wildlife species which reside within the herd management areas. The following paragraphs discuss how the formula was used.

The overall evaluation of the severity of impacts on wildlife habitat was completed for each wild horse and burros management area.

First, the predicted severity of impact on wildlife habitat was estimated using the formula mentioned above. Variables considered in this analysis were range condition, range trend and percent reduction of burros and horses. Range conditions as displayed by the wild horse and burro element could be rated excellent (8 points), good (6 points), fair (4 points) and poor (2 points). Range trend, as displayed by the wild horse and burro element, could be rated improving (6 points), stable (4 points) and declining (2 points). The percent reductions of wild horses and burros were taken from the wild horse and burro element (Table 1); reductions were scaled by one point for each 10 percent interal, 90-99 percent reduction (10 points), 80-89 percent (9 points). . . 0-9 percent (1 point). If wild horses and burros are to be eliminated from a management area, an additional four points were added to that management area score. The sum of these three values, or four if all wild horses or burros are to be removed, yielded the predicted severity of the impacts on wildlife habitats as follows: highy negative (5-8 points), negative (9-13 points), no substantial impacts (14-15 points), positive (16-20 points) and highly positive (21-24 points). End points on the scale were based on the minimal and maximal totals (excluding the added 4 points from total removal). The minimum was equal to a declining range (2 points) in poor condition (2 points) with no reductions in wild horses and burros (1 point) for a total of 5 points and the maximum was equal to an improving range (6 points) in excellent condition (8 points) with 99 percent wild horse and burro reductions (10 points) for a total of 24 points. The scale does not have equal intervals, that is some of the categories have a greater point spread than others. The scale was balanced so that the interval lengths were equal for intensity pairs, positive and negative (5 points) and highly positive and highly negative (4 points). Table 2 displays the information for each management area. Intervals were determined as follows:

1. There are probably few herd management areas without impacts severe enough to consider as positive or negative, therefore the no substantial impact interval was kept narrow (2 points).

2. Since the remaining intervals were equal, because of the limited number of points available, a decision was made to allow positive and negative scales have a slightly wider point spread than the highly negative and highly positive scales.

The above analysis estimate the severity of impacts on wildlife habitat in general. Then it was necessary to account for specific wildlife resources occuring in each wild horse and burro management area. This was achieved by subtracting points from the totals of each wild horse and burro management area habitat score. Points were subtracted using the following set of criteria:

- subtract 1 point for: 1 rare, threatened or endangered species, or 1-3 sensitive or proposed sensitive species and special areas, or 1-10 significant species

- subtract 2 points for: 2 rare, threatened or endangered species, or 4-6 sensitive or proposed sensitive species and special areas, or 11 significant species.

- subtract 3 points for: 3 rare, threatened or endangered species, or 7-10 sensitive or proposed sensitive species and special areas.

- subtract 4 points for: 4 rare, threatened or endangered species, or 10 sensitive or proposed sensitive species and special areas.

- subtract 5 points for: 5 rare, threatened or endangered species.

The scale used for the habitat analysis (Table 2) was recalibrated to reflect the shift toward the lower end of the scale; that is what would be rated 8 or highly negative would now be rated negative. The pattern was similar to that of the previous scale in that intervals of similar severity were equal in interval length and negative/positive interval width was greater than the high negative/high positive interval width. The new scale was as follows: highly negative (1-5 points), negative (6-11 points), no substantial impact (12-13 points), positive (14-19 points), and highly positive (20-24 points). If the point total was less than 1, the point value was rounded to 1.

This information is included in Table 3.

The overall severity of impacts of this element was determined by computing the means of the values for each wild horse and burro management area over each alternative. The same scale was used for the effects of wildlife and habitat as noted above. The summary row on Table 3 displays the average severity of impacts on wildlife.

The major advantage of this evaluation procedure is that all 37 herd management areas are evaluated using the same technique. Therefore all herd management areas impact values are comparable. This system does, however, have a number of disadvantages. Range condition and trend information, as noted earlier, may be of questionable accuracy. If these estimates are incorrect, then the analysis cannot be accurate. The factors for special wildlife species and areas does not reflect the importance of the range of that species or special area which overlaps with herd management areas. However comparisons between Table 2, the analysis without the species and habitat factors, and Table 3, the analysis with the species and habitat factors, indicate that although there are differences for some herd management areas, the average impacts of all herd management are quite similar.

This technique probably underestimates the severity of impacts in comparison to specific evaluations on each herd management area. Quantitative criteria could be developed to analyze the importance of each species and special habitat in a more meaningful way than the mathematical technique.

The summary analysis of the impacts of the Wild Horse and Burro Element on wildlife as presented in the Desert Plan Environmental Statement includes:

1) the averages (means) of the severity of impact over all of the herd management areas (37)

2) a discussion of the potential violations of the element and environmental impact assumptions

3) a summary of the condition and trend of all herd management areas

4) a discussion of the differences between positive wildlife programs under the Livestock Grazing Element and the lack of these programs under the Wild Horse and Burro Element within grazing allotments, the positive programs will be implemented. However in herd management areas outside grazing allotments, these positive programs will not be implemented. Approximately 60 percent of the herd management areas lie outside grazing allotments.

Thus, the overall analysis was based upon the mathematical formula and other pertinent information. Tables 1-3 follow.

TABLE 1

Wild Horse and Burro Element Proposed Reductions

Herd Management Areas	H[1]	B[2]	H	B	H	B	H	B		
Piper Mtn 1	40[3]	105[4]	32	94$^{(14)}$[5]	30	83$^{(19)}$	24	84$^{(26)}$	F	D
Saline Valley 2		800		800^{0}		800^{0}		800^{0}	F	D
Hunter Mtn 3	200	800	41	142$^{(82)}$	39	109$^{(85)}$	37	95$^{(87)}$	P	D
Sand Spr/Last Chance 4		200		160$^{(20)}$		145$^{(28)}$		123$^{(38)}$	P	D
Lee Flat 5		60		46$^{(23)}$		45$^{(25)}$		44$^{(27)}$	F	I
Centennial Valley 6		117		59$^{(50)}$		56$^{(52)}$		29$^{(75)}$	F	D
Darwin 7		118		107$^{(9)}$		101$^{(14)}$		92$^{(22)}$	F	D
Towne Pass 8		700		0$^{(100)}$		0$^{(100)}$		0$^{(100)}$	P	D
Panamint Mtn 9		175		0$^{(100)}$		0$^{(100)}$		0$^{(100)}$	P	D
Slate Range 10		218		218$^{(0)}$		218$^{(0)}$		218$^{(0)}$	F	D
Trona 11		1300		975$^{(25)}$		975$^{(25)}$		975$^{(25)}$	P	D
Coso Basin 12	448	1950	258	39$^{(88)}$	239	26$^{(89)}$	230	19$^{(90)}$	F	S
Chicago Valley 13		25		25$^{(0)}$		25$^{(0)}$		25$^{(0)}$	F	S
Kramer 16		25		0$^{(100)}$		0$^{(100)}$		0$^{(100)}$	G	S
Summit Pass		?		?		?		?	?	?

17										
Ord Mtn		25		$25^{(0)}$		$13^{(48)}$		$8^{(68)}$	F	S
18										
Cave Mtn		5		$5^{(0)}$		$5^{(0)}$		$5^{(0)}$	G	S
19										
Morongo		20		$13^{(35)}$		$13^{(35)}$		$9^{(55)}$	G	S
20										
Clark Mtn		325		$180^{(45)}$		$143^{(56)}$		$89^{(73)}$	F	D
21										
Indian Spr		150		$98^{(35)}$		$66^{(56)}$		$43^{(71)}$	F	D
22										
Granite Mtn		155		$107^{(31)}$		$113^{(27)}$		$100^{(55)}$	F	D
23										
Providence Mtn		195		$144^{(26)}$		$135^{(31)}$		$79^{(59)}$	F	D
24										
Woods/Hackberry	12	175	6	$115^{(35)}$	4	$75^{(56)}$	2	$40^{(77)}$	F	D
25										
Mary Spr		30		$21^{(30)}$		$15^{(50)}$		$8^{(73)}$	F	D
26										
Cut Spring		20		$14^{(30)}$		$10^{(50)}$		$5^{(75)}$	F	D
27										
Piute Mtn		50		$32^{(36)}$		$13^{(74)}$		$13^{(74)}$	F	S
28										
Dead Mtn		50		$35^{(30)}$		$35^{(30)}$		$35^{(30)}$	F	D
29										
Chemehuevi		800		$320^{(60)}$		$320^{(60)}$		$320^{(60)}$	F	D
30										
Palm Cyn	6		$2^{(66)}$		$2^{(66)}$		$2^{(66)}$		G	S
31										
Coyote Cyn	20		$0^{(100)}$		$0^{(100)}$		$0^{(100)}$		F	S
32										
Chuckwalla		20		$16^{(20)}$		$15^{(25)}$		$15^{(25)}$	F	D
33										
Chocolate Mtn		500		$0^{(100)}$		$0^{(100)}$		$0^{(100)}$	F	S
34										

Milpitas Wash 35		75		0(100)		0(100)		0(100)	F	S
Picacho 36		50		40(20)		40(20)		40(20)	?	?
Ash Meadows 37	20		17(15)		17(15)		16(20)		F	D
E	746	8788	356	3820	331	3602	311	3313	Total	NA
Total AUMs	8952	105,456	4272	45,960(57)	3972	43,224(59)	3732	39,756(62)	H/B	
									9564	
									114,408	

1: Horses
2: Burros

3: Projected Horse Numbers
4: Projected Burro Numbers
5: Percent reduction combined horses and burros

Table 2

Severity of Impacts of The Wildhorse and Burro Element on Wildlife Habitat

SCALE	
5	
6	Highly
7	Negative
8	
9	
10	
11	Negative
12	
13	
14	No Substantial
15	Impact
16	
17	
18	Positive
19	
20	
21	
22	Highly
23	Positive
24	

Herd Management Area	NO ACTION	PROTECT	BALANCED	USE
Piper Mtn. (1)	7	8	8	9
Saline Valley (2)	7	7	7	7
Hunter Mtn. (3)	5	13	13	13
Sand Spr/Last Chance (4)	5	7	7	8
Lee Flat (5)	11	13	13	13
Centennial Valley (6)	7	12	12	14
Darwin (7)	7	7	8	9
Town Pass (8)	5	18	18	18
Panamint Mtns (9)	5	18	18	18
Slate Range (10)	7	7	7	7
Trona (11)	5	7	7	7
Coso Basin (12)	9	17	17	18
Chicago Valley (13)	9	9	9	9
Kramer (16)	11	24	24	24
Summit Pass (17)	0	0	0	0
Ord Mtn.				

(18)	9	9	13	15
Cave Mtn. (19)	11	11	11	11
Morongo (20)	11	14	14	16
Clark Mtn. (21)	7	11	12	14
Indian Sps. (22)	7	10	12	14
Granite Mtns. (23)	7	10	9	12
Providence Mtns. (24)	7	9	10	12
Woods/Hackberrys (25)	7	10	12	14
Marl Spring (26)	7	10	12	14
Cut Spring (27)	7	10	12	14
Piute Mtns. (28)	9	12	16	16
Dead Mtns. (29)	7	10	10	10
Chemehuevi (30)	7	13	13	13
Palm Cyn. (31)	11	17	17	17
Coyote Cyn. (32)	9	22	22	22
Chuckwalla (33)	7	9	9	9
Chocolate Mtn. (34)	9	22	22	22
Milpitas Wash (35)	9	22	22	22

Picacho (36)	1	3	3	3
Ash Meadow (37)	7	8	0	9
Summary	$\bar{x}^1$ = 7.3	11.6	12.2	12.94
	var^2 = 5.99	28.95	28.50	28.00
	SD^3 = 2.48	5.46	5.42	5.37

[1] mean

[2] variance

[3] 1 standard deviation

Table 3: Severity of Impacts of the Wild Horse and Burro Element on Wildlife Habitat and Wildlife.

① ② ③

	Herd Managent Area	No Action/ Alternative/	Protection Alternative	Balanced Alternative	Use Alternative
1)	Piper Mountain	7-4 = ● 3	8-4 = ● 4	8-4 = ● 4	9-4 = ● 5
2)	Saline Valley	7-4 = ● 3	7-4 = ● 3	7-4 = ● 3	7-4 = ● 3
3)	Hunter Mountain	5-2 = ● 3	13-2 = ◑ 11	13-2 = ◑ 11	13-2 = ◑ 11
4)	Sand Spring / Last Chance	5-2 = ● 3	7-2 = ● 5	7-2 = ● 5	8-2 = ● 6
5)	Lee Flat	11-2 = ◑ 9	13-2 = ◑ 11	13-2 = ◑ 11	13-2 = ◑ 11
6)	Centennial Valley	7-2 = ● 5	12-2 = ◑ 10	12-2 = ◑ 10	14-2 = ○ 12
7)	Darwin	7-1 = ● 6	7-1 = ● 6	8-1 = ● 7*	9-1 = ● 8*
8)	Towne Pass	5-2 = ● 3	18-2 = ⊕ 16*	18-2 = ⊕ 16*	18-2 = ⊕ 16*
9)	Panamint Mountains	5-2 = ● 3	18-2 = ⊕ 16*	18-2 = ⊕ 16*	18-2 = ⊕ 16*
10)	Slate Range	7-2 = ● 5	7-2 = ● 5	7-2 = ● 5	7-2 = ● 5
11)	Trona	5-3 = ● 2	7-3 = ● 4	7-3 = ● 4	7-3 = ● 4
12)	Coso Basin	9-4 = ● 5	17-4 = ○ 13	17-4 = ○ 13	18-4 = ○ 14
13)	Chicago Valley	9-2 = ◑ 7	9-2 = ◑ 7	9-2 = ◑ 7	9-2 = ◑ 7
14)	Pilot Knob	0 ●	0 ●	0 ●	0 ●
15)	Slocum	0 ●	0 ●	0 ●	0 ●
16)	Kramer	11-1 = ○ 10*	24-1 = ⊕ 23	24-1 = ⊕ 23	24-1 = ⊕ 23
17)	Summit Pass	0 ●	0 ●	0 ●	0 ●
18)	Ord Mountain	9-3 = ◒ 6	9-3 = ● 6	13-3 = ◑ 10	15-3 = ○ 12
19)	Cave Mountain	11-2 = ◑ 9	11-2 = ○ 9*	11-2 = ○ 9*	11-2 = ○ 9*

Table 3: (Continued from previous page)

		n.a.	prot.	bal.	use
20)	Morongo	11-2=◑ [illegible]	[illegible]-2=○ 12	[illegible]-2=○ [illegible]	16-2=○ 14*
21)	Clark Mountain	7-3=● 4	[illegible]-3=◑ 8	12-3=◑ 9	14-3=◑ 11
22)	Indian Spring	7-3=● 4	10-3=◑ 7	12-3=◑ 9	14-3=◑ 11
23)	Granite Mountain	7-3=● 4	10-3=◑ 7	9-3=◑ 6*	12-3=◑ 9
24)	Providence Mountains	7-3=● 4	9-3=● 6	10-3=● 7*	12-3=◑ 9
25)	Woods / Hackberry	7-3=● 4	10-3=◑ 7	12-3=◑ 9	14-3=◑ 11
26)	Marl Spring	7-2=● 5	10-2=◑ 8	12-2=◑ 10	14-2=○ 12
27)	Cut Spring	7-3=● 4	10-3=◑ 7	12-3=◑ 9	14-3=◑ 11
28)	Piute Mountain	9-3=● 6	12-3=◑ 9	16-3=○ 13	16-3=○ 13
29)	Dead Mountains	7-2=● 5	10-2=◑ 8	10-2=◑ 8	10-2=◑ 8
30)	Chemehuevi	7-4=● 3	13-4=◑ 9	13-4=◑ 9	13-4=◑ 9
31)	Palm Canyon	11-4=○ 7*	17-4=○ 13	17-4=○ 13	17-4=○ 13
32)	Coyote Canyon	9-4=● 5	22-4=⦶ 18	22-4=⦶ 18	22-4=⦶ 18
33)	Chuckwalla	7-3=● 4	9-3=● 6	9-3=● 6	9-3=● 6
34)	Chocolate Mountains	9-3=● 6	22-3=⊕ 19	22-3=⊕ 19	22-3=⊕ 19
35)	Milpitas Wash	9-3=● 6	22-3=⊕ 19	22-3=⊕ 19	22-3=⊕ 19
36)	Picacho	1-2=● 0	3-2=● 1	3-2=● 1	3-2=● 1
37)	Ash Meadows	7-2=● 5	8-2=● 6	8-2=● 6	9-2=◑ 7

SUMMARY	●	◑	◑	◑
$\bar{x}$ =	4.51	8.67	9.11	9.81
var =	5.98	30.07	29.93	30.04
SD =	2.47	5.56	5.55	5.56

Scale:

1 - 5 = highly negative/ ●

6 - 11 = negative/ ◑

12 - 13 = no substantial impact/ ○

14 - 19 = positive/ ⦶

20 - 24 = highly positive/ ⊕

① = Value from habitat impact table (table 2)

② = Value of wildlife in the HMA

③ = Impact value

* Impact not evaluated from scale; incomplete data set or other reason.

Nature of Impacts

Since the passage of Public Law 92-195, the Wild Free-roaming Horse and Burro Act, by Congress in 1971, control over horse and burro numbers has declined. Concomitantly, wild horse and burro numbers have increased at a rapid rate. Field data indicate that burro populations are increasing at about 20 (R. F. Seegmiller, pers. comm) to 30 (S. Carothers, pers. comm.) percent per year in parts of the southwestern United States. It is suspected that horse numbers are increasing at similar rates (Cook 1975). As horse and burro numbers stabilize, their range probably would deteriorate to such an extent that horse and burro numbers would be regulated by starvation (Cook 1975). Disease (Cook 1975) and predation appear to play little role in regulation of populations of these exotic species (Seegmiller 1977)

The majority of the technical papers in the literature concern the impacts by burros rather than horses, thus most of the specific information will address burros. Burros are currently a greater problem in the CDCA than horses. Burros are in greater numbers, an estimated 8788 burros to 746 horses (Desert Plan - Wild Horse and Burro Element 1980), and affect a greater number of sensitive wildlife resources than do horses because of their wider distribution.

Wild horses and/or burros impact wildlife in a variety of ways including:

1) Consumption of similar forage items (Hubbard and Hansen 1975); i.e. diet overlap between burros and bighorn (Browing 1960, McMichael 1964, Russo 1956, Seegmiller 1977, St. John 1975, Walters and Hansen 1978)
   diet overlaps between burros and mule deer (Hubbard and Hansen 1975, Koehler 1974, Walters and Hansen 1978)

2) reduction of cover, increasing soil erosion (McKnight 1958)

3) rodents affected by browsing and trampling (Carothers et al. 1976)

4) versatility of burros as foragers (Browning 1960, Carothers et al. 1976, Hansen and Martin 1973, Ohmart et al. 1975, Seegmiller 1977, Walters and Hansen 1978)

5) overgrazing near water sources (Brady and Hanley 1975, Fisher 1975, Hanley and Brady 1977b)

6) Consumption of large amounts of forage (Cook 1975, Koehler 1974)

7) removal of selected plant species (Douglas and Norment 1977, Hansen 1973)

8) reduction in plant volumes (Fisher 1975)

9) pulling forage plants out by roots (McKnight 1958)

10) stripping branches from small paloverde trees (Seegmiller 1977)

11) pollution of water sources (Dixon and Sumner 1939, Ferry 1955)

12) destruction of improved water sources (Weaver 1972)

13) displacement of bighorn sheep from water sources (McMichael 1964)

14) soil damage and erosion from trailings near water sources (Russo 1965, Weaver 1959)

15) soil compaction inhibits or eliminates seedlings (Farrell 1973, Koehler 1974)

Although a number of these impacts such as fouling water sources (Farrell 1973, Moehlman 1974, Seegmiller 1977, Welles and Welles 1961, Woodward 1976) and displacement from water holes as mentioned by McMichael (1964) (Russi, pers. comm.) can be challenged, it is clear that these feral animals impact wildlife in a number of ways.

The most severe problem regarding the impacts of these animals, may be the slow recovery rate of native vegetation (Weaver 1972). Obviously burros and to a lesser degree wild horses are a serious problem in the CDCA. Unless effective controls are placed on these populations, one can only expect increasing numbers of these animals and decreasing quality of wildlife habitat and quantity of certain wildlife species such as bighorn sheep.

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APPENDIX 10b (ix)

Impacts of the Land Tenure Element on Wildlife

Methods of Determining Impacts

Potential impacts generated by the Land Tenure Element were assessed using criteria based on the following assumptions:

1. All lands included for acquisition or disposal would be acquired or disposed over the life of the plan (20 years).

2. Acquisition of lands for Areas of Critical Environmental Concern (ACEC), Class C and Class L generally would have a positive impact on wildlife by placing large, contiguous blocks of land under the administration of one agency, the BLM.

3. Acquisition of Class I lands would have a negative impact on wildlife because habitat quality would be degraded due to intensive off-road vehicle use and/or mineral development and extraction.

4. Disposal of lands would have negative impacts in areas containing state and/or federally listed species, sensitive, and proposed sensitive species, and selected significant species.

5. Disposal of "islands" of public land surrounded by private lands could have two consequences: 1) little impact because the areas have been affected deleteriously already; or 2) negative impacts when large portions of an important habitat and/or of species ranges are involved.

6. Lands will be acquired in a random, "as available" fashion. There will not be a unified plan to acquire lands with high wildlife values.

7. Management of lands acquired by the Bureau of Land Management will be enlightened, that is management will benefit wildlife.

The procedure for assessing these impacts involved two different mapping phases. Phase One included developing a land tenure overlay from the Official Land Tenure Adjustment maps (1:250,000 scale). The Land Tenure Element maps were complex, with areas of prospective transfer lands as small as one half section. To ease the impact evaluation process, working maps were developed using the general outline of different land tenure classes. Accuracy of the working overlay maps for each alternative varied from relatively precise boundaries for Class I and ACEC acquisition to general boundaries for Classes C or L acquisition. The precision of the borders for areas of disposal were close to those for Class I and ACEC but were less precise. The second mapping phase involved overlaying land tenure working maps for each plan alternative on maps of wildlife resources to determine the areas of species range and unique and representative habitats proposed for disposal, ACEC acquistion and C and L acquisition. The amount of wildlife habitat within each land transfer category was used to estimate the degree of impact. For example, if a relatively large or important portion of a species' habitat was classified for disposal, the impact rating was "highly negative." "Negative" or "no substantial impact" rating were assigned where only a small portion of a species range was proposed for transfer.

In the California Desert Plan Draft Environmental Statement, the impacts of land acquisition and disposal under each of the three alternative were estimated for 15 selected wildlife species. In most cases, lands to be acquired would have a positive or highly positive impact on the wildlife species, whereas land disposal generally would have a negative or highly negative impact on wildlife species.

Nature of Land Tenure Element Impacts

Impacts of this element on wildlife were based on the relative amounts of additions to or deletions from protection-oriented land class designations. However, land acquisition and disposal is not based necessarily on wildlife values. If management considers wildlife values to be important, then the impact evaluations would underestimate the positive aspects of land acquisition. If management exhibits neutral or negative attitudes toward acquisition of wildlife habitat (the situation to date), impact evaluations would underestimate the negative nature of the actions.

Acquisition of lands for Class I designation would have highly negative impacts on the vast majority of wildlife species. This class would receive intensive use in the form of off-road vehicle open areas or mining areas. Both of these activities have severely negative impacts on wildlife; however mining tends to be more restricted in the area of impact and may be controlled to a limited extent by federal regulations to restore the site. Conversely, off-road vehicle open areas are difficult to control and generally impact much broader areas.

Land disposals may negatively impact wildlife through loss of important or large areas of habitat. However, if the disposal areas and adjacent lands have been heavily impacted previously, disposal may have little substantial impact on wildlife.

Acquisitions for most ACECs would generally benefit wildlife as most ACECs would be protected for wildlife and other values. Acquisitions for Classes C and L would also generally be positive for wildlife. These are the most protected areas for wildlife under any alternative of the Desert Plan. Acquisition of lands also would permit a unified management program by one land holder, thereby benefiting wildlife.

A final consideration is the assumption that the Bureau of Land Management would provide management which is beneficial to wildlife. If this assumption is false, the impact evaluations for land acquisition would overstate the positive nature of the actions. Disposal of areas could be positive if this assumption is false, and if, for example, the land is acquired by the California Department of Fish and Game for wildlife purposes.

APPENDIX 10b (x)

Impacts of Wildlife Element on Wildlife

Methods of Determining Impacts

The impacts of the Wildlife Element on wildlife resources were determined using analysis of existing Bureau policies and guidelines, Wildlife Element proposals, and class guideline restrictions from the Desert Plan. Overall ratings for each alternative were assigned on the basis of impacts compared with the current situation. Wildlife resources currently are in a state of decline. Under the No Action Alternative, declines would continue for populations and habitat of several state and federal listed species and the desert tortoise, a BLM sensitive species, as well as many significant species and proposed BLM sensitive species. Land-use decisions would be dealt with on a case-by-case basis, a method incompatible with handling wildlife resources on a desert-wide basis. Positive actions undertaken in this alternative would be insufficient to meet the intent of the Endangered Species Act or Bureau manuals and policies regarding listed species, sensitive species and unique or representative ecosystems.

Ratings on the Balanced, Use and Protection Alternatives were given using the following assumptions:

1) the present situation was used as a baseline for analysis,
2) active, positive management plans for wildlife resources are compatible with class C and L guidelines, but incompatible under class M and I constraints,
3) protective management areas (Habitat Management Plans, restrictive designation on roads, Wilderness Management Plans and ACECs) are designed to have a positive impact on faunal resources to the degree stated in the plans,
4) while the Bureau generally intends to protect listed wildlife and sensitive species in accordance with environmental law and Bureau policies, there are not active programs of habitat management for protection of some officially listed as well as most sensitive, "proposed" sensitive and significant species. The lack of agressive programs is contributing to declines of several species, and
5) implementation of all wildlife management plans described in the Wildlife Element will take place from one to seven years after approval of the Desert Plan.

Nature of Impacts

The intent of the Wildlife Element is to provide the maximum protection to wildlife species and habitats allowed under each plan alternative. Development and implementation of effective habitat management plans, wilderness management plans, and road designation restriction proposal in the Wildlife Element would have positive impacts on all or portions of the ranges of several officially listed, sensitive, "proposed" sensitive, and significant species and all or portions of several special habitat areas. Negative impacts resulting from this element are the result of two factors: (1) the land-use class system and polygon approach to the Desert Plan, and (2) the inability to institute habitat management plans or other active wildlife programs on class M and I designated lands. These limitations prevent the development and implementation of coordinated desertwide programs to protect, enhance, and monitor officially listed, sensitive, "proposed" sensitive, and significant species, and special wildlife habitat. The mosaic pattern of use and protection-oriented lands under all proposed alternatives has several negative effects: (1) lack of active management on class M and I lands could cause violation of federal law and Bureau policy if populations of listed species decline and new species are listed; (2) heavy use of class M and I lands will result in widespread habitat degradation, and subsequent declines and local extirpation of some species; and (3) the varying degrees of impacts allowable in each respective land class designation makes management of species present within more than one use category exceedingly difficult.

Habitat management plans and wilderness management areas should protect selected species and habitats within limited areas of varying size. Many have been designed to protect a specific species or habitat. The size of each area and its specific management plan also limits the degree of positive impact on constituent wildlife populations. Many are not large enough to adequately protect the species or habitat sufficently to have an overall positive effect. This is especially true of ACECs which are often quite small in size and designed primarily to protect a single location, not a habitat type or species.

Designated wilderness areas in Balanced and Use Alternatives will favor more montane species and habitats. Road Designation Restriction Areas, while limiting motorized vehicle use, do not necessarily limit other consumptive or incompatible uses such as agricultural development, mineral extraction or grazing. While specific wildlife species and habitats receive some protection within these management areas, serious declines may still be expected on adjacent use-oriented lands. The creation of a number of wildlife management areas, while having a varying degree of value to wildlife resources under each plan alternative, fails to provide for a uniform desert-wide ecosystems approach.

APPENDIX 10d

Impacts of Areas of Critical Environmental Concern on Wildlife

Methods of Determining Impacts

The impacts of Areas of Critical Environmental Concern (ACEC) on wildlife resources vary with the specific proposals included in each ACEC management prescription. Therefore, the impacts of ACECs on wildlife were determined independently for each area. For each ACEC, the wildlife staff was provided with one to four sets of recommendations prepared by various DPS resource specialists. Conflicts between management guidelines for ACECs proposed by more than one resource had not been resolved. To allow the impact analysis to proceed, the wildlife staff was instructed to assume that the most protective set of recommendations would be chosen for the final management prescription. Thus, the impact analysis was performed on a "best case" basis. Impact assessments for Corn Spring and Afton Canyon ACECs were revised when a decision was made not to move or eliminate the campground.

The beneficial or detrimental effects of each ACEC on wildlife were evaluated by analyzing the effects of specific recommendations in the "best case" management prescription. Impact information gathered while evaluating the plan elements (e.g., recreation, motorized vehicle access, livestock grazing and wild horses) was used in the process. Assumptions were made that implementation of the management prescription would be effective, that desired objectives would be achieved, and that the public would comply with use restrictions. Past experiences in attempts to protectively manage or control visitors at Corn Springs, Afton Canyon, Algodones Dunes, Eureka Dunes, Darwin Falls, San Sebastian Marsh, and other future ACECs indicate these assumptions may be invalid. As a result, beneficial impacts to wildlife would be lessened, and existing negative impacts could continue at some sites.

Wildlife resources affected by each designated ACEC were identified by preparing a map with approximate ACEC boundaries, and overlaying it on wildlife resource base maps. Wildlife values occurring within each ACEC were recorded and used as the basis for determining probable impacts.

Nature of Impacts

Management prescriptions proposed for the 50 accepted ACECs are generally designed to protect natural and cultural resource values. Wildlife resources will benefit from this protection. One possible exception to the generality is the habitat degradation and disturbance to wildlife that will result from higher visitor use resulting from increased public awareness of the areas. Management recommendations included in most prescriptions can be grouped into 14 general categories. Beneficial or detrimental impacts of each are described briefly below:

1) Control Vehicular Use. Eliminating off-road vehicular use will prevent habitat destruction, direct wildlife mortality, and disturbances during the breeding season. This management recommendation will be highly beneficial to wildlife. Limiting ORV use in some ACECs is theoretically beneficial to wildlife, but such restrictions in small areas, especially where a campground is located, have proven to be difficult to enforce, and wildlife resources have declined.

2) Remove Burros/Grazing. Fencing riparian areas and springs would prevent overutilization and trampling of these important wildlife habitat types. Wildlife populations of many species would increase, and new species may invade or return to previously degraded habitats as recovery occurs. In areas where riparian vegetation is only part of the habitat required to protect a species (e.g., Inyo Brown Towhee) fencing only riparian areas and springs would not achieve the desired goals.

3) Control Visitor Use and Camping. Habitat degradation and disturbances to wildlife caused by human activity, trampling, soil compaction, firewood cutting, etc., will be eliminated, reduced or confined to limited areas if regulations are enforced and public compliance is achieved.

4) Reduce Water Overdraft. This action will protect sensitive and highly productive marsh and riparian habitats, and will be highly beneficial to wildlife.

5) Prohibit/Control Mining. Limiting or excluding mining from key areas will prevent the habitat destruction and water use associated with most operations.

6) Restrict Collecting. A beneficial management recommendation that would prevent the removal of sensitive natural and cultural resources.

7) Remove Exotic Vegetation. Undesirable salt cedar would be removed from riparian and marsh habitats in selected ACECs. Native vegetation would be reestablished and encouraged through active management. Wildlife populations would increase and new species may invade or return as recovery occurs.

8) Increase On-the-ground Surveillance. Frequent ranger patrols would promote compliance with other management guidelines and increase the effectiveness of protection afforded to wildlife resources.

9) Stabilize/Rehabilitate Features. Most efforts to stabilize or restore cultural resource values are compatible with or beneficial to wildlife resources; occasionally detrimental impacts may occur (refer to Cultural Resources/Native American Values analysis elsewhere in this appendix).

10) Continue Present Management Arrangement. Continuing protective management of areas currently managed to conserve cultural and natural resource values would benefit wildlife resources, if existing management has been effective.

11) Establish Cooperative Agreement. Management actions in cooperative agreements could range from increased surveillance to joint management with direct participation by more than one agency. If properly implemented, agreements should result in increased protection of wildlife resources. Coordination with owners of lands adjacent to or within an ACEC would be beneficial to wildlife.

12) Implement Comprehensive Habitat Management Plan (HMP). Preparation and implementation of HMPs where coordinated and intensive wildlife management programs are required would be beneficial to wildlife resources if appropriate use restrictions and management guidelines are adopted and effectively implemented.

13) Acquire Private Holdings. Consolidating ownership would permit protective management of the entire resource, preventing or eliminating incompatible uses on adjacent areas.

14) Implement Interpretive Program. Public education of natural resource values would be beneficial to wildlife. However, increased visitor use at the ACEC could be detrimental if habitat degradation or disturbances to wildlife are not controlled.

WILDLIFE APPENDIX 10e

Cumulative Impacts

Methods of Assessing Impacts

Assessment of the cumulative effects of resource activities (utilities, recreation, motorized vehicles, wildlife grazing, etc.) on wildlife resources was made using three analytical techniques including: 1) direct comparisons of cause and effect; 2) indirect comparisons of cause and effect; and 3) best professional judgment of one or more experts. Sources of information for these three techniques included: published literature, technical reports and papers, unpublished research, BLM contracts and reports, and personal observations. Several annotated bibliographies and papers were prepared on selected impact topics in order to summarize in depth and to analyze critically the available information and data. Examples of papers include effects on wildlife of general recreation, geothermal development, utility corridors, wind generation plants, agricultural and urban developments, etc. Annotated bibliographies were prepared on wild horse and burro grazing and livestock grazing.

Direct comparisons of cause and effect were possible in many cases because studies had been undertaken at the very sites in question, i.e. the effects of general recreation on birds in Afton Canyon, the effects of motorized vehicles on vertebrates in Dove Springs Canyon, and the effects of burros on vegetation in the Panamint Mountains. Indirect comparisons of cause and effect involved analysis of studies in similar or comparable areas and then extrapolation of results to site specific areas in the CDCA. Examples for use of this technique include: comparing impacts of feral burros on wildlife habitat along the Colorado River and in desert parts of Arizona with potential impacts on similar habitats in the CDCA; and extrapolating impacts of paved and dirt roads on various species of wildlife from numerous published articles of research done elsewhere in the U.S.

Professional judgment was used when similar studies and data were lacking, and when applying indirect cause and effect techniques.

Cumulative impacts were estimated for each listed, sensitive, proposed sensitive and significant species, and special habitat areas using the mapping technique described below.

Transparent maps of all other resource activities were overlaid and a cumulative impact map compiled. Cumulative impact overlays were developed using the three analytical techniques already described. The activities and their relative impact on wildlife resources, as determined by a review of existing literature, contract reports and personal observations are:

1) Impacts with severe disturbance (total habitat loss)

   - a. wind generation and microwave sites
   - b. ORV open areas
   - c. areas with combinations of three or more of the activities listed below in (2)

2. Impacts with high disturbance to wildlife habitats

   - a. utility corridors
   - b. locatables and leasables (i.e. extraction and development of mineral resources)
   - c. livestock grazing allotments
   - d. wild horse and burro herd areas
   - e. existing roads and trails
   - f. KGRAs (known geothermal resource areas)

3. Impacts neither highly positive nor highly negative in nature

   - a. Class L areas with no specifically sited impacts
   - b. wilderness areas where livestock grazing and/or wild horse and burros occur and where a special wildlife habitat management area exists
   - c. group (2) areas if a special wildlife habitat management area exists.

4. Positive Impacts to wildlife habitats and species

   - a. designated wilderness areas
   - b. ACEC's established for nonwildlife purposes

5. Highly positive Impacts

   - a. ACEC's of critical importance to wildlife, with management prescriptions designed to protect these resources.

The cumulative overlays were then placed over the species and special area range maps, and areas of overlays were measured. The proportion of range falling into each impact severity category was then computed and those values were placed in cumulative impact tables for wildlife values.

A summary cumulative impact (Table 1) was computed using the average impact of each element on wildlife (from the dot tables). Each element was weighted by estimating the relative effect of each element on wildlife. Weights were from 1, an impact which affected wildlife relatively slightly such as the Land Tenure Adjustment Element, to 4, an impact which affected wildlife relatively severely, such as the Motorized Vehicle and Wilderness elements. This procedure resulted in a weighted mean for all elements and a more real summary cumulative impact than would result from an arithmetic mean.

Cumulative impacts of the No Action Alternative were estimated by overlaying species and special area range maps with maps of each alternative, and then measuring the amount of a specific wildlife resource in L, M and I multiple use classes. Scoring for the intensity of impacts was as follows: Class I is severely negative, Class M is negative; Class L is no substantial impact. It should be noted that there are no positive or highly positive impacts under this scheme, because none of the classes is positive for wildlife and there are no wilderness areas or ACECs which are positive to highly positive for wildlife. There are no specific plans for development in the No Action Alternative as there are in the Protection, Balanced and Use Alternatives. So, the specific impacts of power generation sites, KGRAs, mining areas, pipelines, etc. cannot be considered in this analysis. As a result the evaluations for this alternative are based solely on class maps and these additional impacts are essentially ignored. On the other hand some potentially positive actions such as some MFP decisions for Yuha, Red Mountain and El Paso planning units and draft MFP decisions for East Mojave planning unit were not addressed.

If both of these balance, one could say that the analysis is fairly representative but since the unconsidered negative activities almost certainly exceed the unconsidered positive measures, the No Action Alternative evaluation is probably overly positive.

Nature of Impacts

The impacts associated with other activities have been individually described. Examples of references include: (1) recreational activities (Atchison 1977, Badaracco 1979, Dickson 1939); (2) utility construction (USDI, BLM 1979; DeVita 1979; Harley 1977; Leitner 1979; Vasek 1975; Schreiber and Graves 1977); (3) mineral exploration and development (Council of Environmental Reality 1977; Rale 1975; Stuart 1974; USDI, Fish and Wildlife Service 1977), (4) off-road vehicle use (Bondello 1976, Davidson and Fox 1974, Bury et al. 1977, Keefe and Berry 1973, Weinstein 1978 etc.); (5) grazing (Weaver 1959,1974; McKnight 1958, Coch 1953,1963; Carothers, Stitt and Johnson 1976) and (6) wilderness (Grislin 1973; USDI,BLM 1979; Wildlife Management Institute 1975). Specific areas of intensive study included the effects of sound on various vertebrates (Bondello and Bealstrom 1979), urbanization (Boyer, Laudenslayer and Wessman, in preparation; England 1979), pipelines and aqueducts (DeVita 1979), animal introductions (DeVita 1979), off-road vehicle use (Keefe and Berry 1973, also Appendix 10b(iii)), harvesting of vegetation (LaPre and Cardiff 1979), transportation facilities (Oxley, Fenton and Carmody 1974), powerplant construction (Rods 1979; Harley 1977), agricultural development (Roush 1979), wind generation systems (Stielstra 1979), wild horse and burro herds (Russi 1979) and oil, gas and geothermal development (Thompson 1979). See also individual appendices dealing with specific impacts on wildlife for more references.

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APPENDIX 12

Summary of Impacts of The Wild Horse and Burro Element by Herd Management Area

Impacts to vegetation, wildlife, and cultural resource within ranges and concentration areas for both wild horses and burros ae summarized on the following tables (WHB - 1, 2, 3, and 4 for the No Action, Protection, Balanced, and Use Alternatives, respectively). For location of these Herd Management Areas, see the Wild Horse and Burro Element Map on page 135 of the draft plan.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 1 Piper Mtn.	Impacts on UPA's: Horse - Eureka Valley Joshua Trees (5%) Burro - Eureka Valley Dunes (10%) Burro - Eureka Valley Joshua Trees (3%) RT & E's: No RT & E's in Concentration Areas. Within Range of Burros: Astragalus lentiginosus var. micans Dedeckera eurekensis Oenothera avita ssp. eurekensis Buddleja utahensis Stipa arida Arabis shockleyi Schlerocactus polyancistrus Cymopterus gilmani Enceliopsis nudicaulis Mimulus rupicola Range Cond/Trend: Fair/Stable. Conc. Areas: Fair/Declining. Pop's: 40 Horses, 105 Burros Existing Veg. Use: Horses: 237.6T/19280 ac (24.6 lb/ac) Burros: 623.7T/19280 ac (64.7 lb/ac) Overall impacts: highly negative.	See Balanced Alternative	Horse Range See Balanced Alternative for cultural resources. Population of 40 horses will likely have moderate overall negative impacts. Burro Range See Balanced Alternative for cultural resources. 105 burros will have moderate to severe negative impacts in this area. Burro Concentration Area See Balanced Alternative for cultural resources. A herd size of 105 burros will certainly have severe negative impacts to cultural resources in this area.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HM2 Saline Valley	Impacts on UPA's: Burro Limestone (Calciphyte) Community (1%) Riparian Areas (6%) Known Concentrations (5%) Eureka Valley Joshua Trees (1%) RT & E's: Within Concentration Areas of Burros: Haplopappus brickellioides Within Range also include: Sclerocactus polyancistrus Range Cond/Trend: Fair/Declining. Conc. Area: Fair/Declining. Pop's: 800 Burros Existing Veg. Use: Burros: 4752T/386,000 ac (24.6 lb/ac) Overall Impacts: highly negative.	See Balanced Alternative.	Burro Range Same as Balanced Alternative. Burro Concentration Area Same as Balanced Alternative.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HM3 Hunter Mtn. (outside DVNM only)	Impacts on UPA's: None RT & E's: Horses: Within Range: Haplopappus brickellioides Phacelia anelsonii Burros: Within Range: Haplopappus brickellioides Phacelia anelsonii Within Conc. Area: Phacelia anelsonii Range Cond/Trend: Fair/Stable Conc. Area: Poor/Declining Pop's: 200 Horses, 800 Burros Existing Veg. Use: Horses: 1188.6T/48,000 ac (49.5 lb/ac) Burros: 4752T/48,000 ac (198 lb/ac) Overall Impacts: Extremely negative	The Cottonwood Mountains Desert Bighorn herd would probably be eliminated. Mule Deer numbers would be reduced. Habitat condition for most wildlife would be severely deteriorated. Water sources would be fouled and valuable riparian habitat destroyed through overgrazing or trampling. Habitat quality for nearly all wildlife would decline.	Horse Range See Balanced Alternative for cultural resources. 200 horses are likely to have very severe negative impacts on the cultural resources in this area. Burro Range See Balanced Alternative for cultural resources. 800 burros will have extremely severe negative impacts on cultural resources in this area. Burro Concentration Area See Balanced Alternative for cultural resources. 800 burros will have extremely severe negative impacts on cultural resources in this area.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 4 Sand Springs/ Last Chance (excludes DVNM & Nevada)	Impacts on UPA's: None RT & E's: Astragalus lentiginosus sesquimetralis Within Burro Concentration Area, this is probably the most sensitive site within a Burro area. A. L. var. sesquimetralis is known only from one other site, that in Nevada. The current population at Big Sand Springs is 50% depleted by Burros. Other RT & E species within Conc. Area include Arabis shockleyi, and Fendlerella utahensis. Range Cond/Trend: Fair/Stable Cond. Area: Poor/Declining Pop's: 200 Burros Existing Veg. Use: Burros: 1188.0T/59140 ac (40.2 lb/ac) Overall impacts: Highly negative.	Habitat conditions would decline for most wildlife. Desert Bighorn would be eliminated from the northern portion of the Last Chance Mountains.	Burro Concentration Areas See Balanced Alternative for cultural resources. A population of 200 burros will have moderate to severe overall impacts on cultural resources.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 5 Lee Flat	Impacts on UPA's: Lee Flat Shadscale Scrub (20% of area). RT & E's: Within Range: Astragalus mohavensis var. hemigyrus Range Cond/Trend: Fair/Stable Pop's: 60 Burros Existing Veg. Use: Burros: 356.4T/73,000 ac (9.8 lb/ac) Overall impacts: Negative	Habitat conditions would decline for most wildlife. The Lee Flat Shadscale Scrub Special Habitat Area would be severely degraded.	Burro Range See Balanced Alternative for cultural resources. 60 burros will probably have moderate negative impacts overall on cultural resources.
HMA 6 Centennial Valley	Impacts on UPA's: None RT & E's: None Pop's: 117 Burros Range Cond/Trend: Fair/Stable Conc. Area: Poor/Declining Existing Veg. Use: Burros: 695T/21,700 ac (64.1 lb/ac) Overall Impacts: Highly negative.	Rising burro numbers would lead to severe degradation of range conditions and concomitant declines in wildlife values.	Burro Range See Balanced Alternative for cultural resources. 117 burros will have severe negative impacts on cultural resources. Burro Concentration Area See Balanced Alternative for cultural resources. 117 burros will have severe negative impacts on cultural resources.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 7 Darwin	Impacts on UPA's: None Impacts on RT & E's: None Range Cond/Trend: Fair/Stable Conc. Area: Fair/Declining Pop's: 118 Burros Existing Veg. Use: Burros: 700.9T/23,800 ac (58.9 lb/ac) Overall Impacts: highly negative	See Balanced Alternative	Burro Range See Balanced Alternative for cultural resources. 118 burros will have severe negative impact on cultural resources. Burro Concentration Area See Balanced Alternative for cultural resources. 118 burros will have severe negative impact on cultural resources.
HMA 8 Towne Pass (outside DVNM only)	Impacts on UPA's: None RT & E's: Burros: Within Conc. Areas: *Eriogonum hoffmannii* ssp. *hoffmannii* *Phacelia mustelina* Within Range Include: *Eriogonum intrafractum* Pop's: 700 Burros Range Cond/Trend: Poor/Declining Conc. Area: Poor/Declining Existing Veg. Use: Burros: 4158T/117,600 ac (70.7 lb/ac) Overall Impacts: highly negative	Already poor and declining habitat conditions would decline further leading to reductions in wildlife species diversity and numbers. Rising burro populations would significantly contribute to eliminating the Hunter Mountain Desert Bighorn herd. In many areas riparian vegetation would be destroyed and water sources fouled.	Burro Range See Balanced Alternative for cultural resources. 700 burros will have extremely severe negative impacts overall on cultural resources. Burro Concentration Areas See Balanced Alternative for cultural resources. 700 burros will have extremely severe negative impacts overall on cultural resources.

TABLE HHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 9 Panamint Mtns. (outside DVNM only)	Impacts on UPA's: Riparian areas in Panamint Mtns (1%) RT & E's: Burros: Within Conc. Areas: Encelliopsis covillei Eriogonum eremicola Eriogonum microthecum var. panamintense Perityle villosa Within Range Also Include: Blepharidachne kingii Range Cond/Trend: Poor/Declining Conc. Area: Poor/Declining Pop's: 175 Burros Existing Veg. Use: Burros: 1039.5T/465010 ac (4.6 lb/ac) Overall Impacts: highly negative	Already poor and declining habitat conditions would decline further leading to reductions in wildlife species diversity and numbers. Rising burro population would significantly contribute to eliminating the Panamint Mountains Desert Bighorn herd. In many areas riparian vegetation would be destroyed and water sources fouled.	Burro Range Same as Balanced Alternative for cultural resources. A population of 175 burros is likely to have moderate to severe negative impacts overall. Burro Concentration Areas Same as Balanced Alternative for cultural resources. 175 burros will have severe negative impacts on cultural resources.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 10 Slate Range (outside Mojave "B" Range only)	Impacts on UPA's: None RT & E's: None Range Cond/Trend: Fair/Declining Conc. Areas: Fair/Declining Pop's: 218 Burros Existing Veg. Use: Burros: 1294.2T/44,800 ac (57.8 lb/ac Overall Impact: highly negative	See Balanced Alternative.	Burro Range Same as Balanced Alternative for cultural resources and impacts.
HMA 11 Trona (outside China Lake Naval Weapons Center only)	Impacts on UPA's: None Impacts on RT & E's: None Range Cond/Trend: Poor/Declining Conc. Area: Poor/Declining Pop's: 1,300 Burros Existing Veg. Use: Burros: 7,722T/128,960 ac (119.8 lb/ac) Overall Impacts: extremely negative	See Balanced Alternative.	Burro Range Same as Balanced Alternative for cultural resources. 1300 burros will have extremely severe negative impacts overall on cultural resources.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 12 Coso Basin	Impacts on UPA's: None Impacts on RT & E's: Horse Range: Cymopterus ripleyi Range Cond/Trend: Fair/Stable Pop's: 448 Horses, 1,950 Burros Existing Veg. Use: Burros: 11583T/332,000 ac (69.8 lb/ac) Horses: 2661.2T/332,000 ac (16.0 lb/ac) Overall Impacts: highly negative	Habitat conditions would decline for most wildlife. Extremely high and increasing burro numbers would contribute significantly to the eventual elimination of Desert Bighorn in the Argus Range. Foraging and nesting areas of the Inyo Brown Towhee would be severely degraded; official listing by the Office of Endangered Species would become highly probable. All riparian habitats and water sources would be seriously damaged.	Burro Range Not assessed - China Lake Naval Weapons Center. Horse Range (outside China Lake Naval Weapons Center only) See Balanced Alternative for cultural resources. 448 horses are likely to have severe negative impacts overall on cultural resources.
HMA 13 Chicago Valley	Impacts on UPA's: None Impacts on RT & E's: None Range Cond/Trend: Fair/Stable Conc. Area: Fair/Stable Pop's: 25 Burros Existing Veg. Use: Burros: 148.5T/30,000 ac (9.9 lb/ac) Overall Impacts: negative	Growing burro numbers would cause further habitat degradation in the Chicago Valley Mesquite Thicket Special Habitat Area. The thicket could ultimately be destroyed by excessive burro use. As this burro herd grows, use in the Nopah range would increase, and the resident Desert Bighorn herd would begin to decline.	Burro Concentration Area Same as Balanced Alternative.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 14 Pilot Knob	No Data Available	See Balanced Alternative	Burro Range Not assessed - Mojave "B" Range.
HMA 15 Slocum Mtn.	No Data Available	See Balanced Alternative	Burro Range Not assessed - Mojave "B" Range.
HMA 16 Kramer	Impacts on UPA's: None Impacts on RT & E's: Burro Range: Puccinellia parishii Cymopterus deserticola Chorizanthe spinosa Pop's: 25 Burros Range Cond/Trend: Good/Stable Conc. Area: Good/Stable Existing Veg. Use: Burros: 148.5T/13,500 ac (22 lb/ac) Overall Impacts: negative	Good habitat condition, stable habitat trend, and small and stable herd size indicate that maintaining this herd under present conditions would not result in significant positive or negative impacts to wildlife. The presence of burros may be causing reduced Desert Tortoise densities.	Burro Range (outside Edwards AFB) Same as Balanced Alternative for cultural resources. A herd size of 25 burros will probably have mild negative impacts overall on cultural resources.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 17 Summit Pass	No Data Available	See Balanced Alternative	Burro Range Same as Balanced Alternative for cultural resources. Impacts not assessable due to unknown population numbers.
HMA 18 Ord Mtn.	Impacts on UPA's: Burro: Jojoba Enclave E. Ord Mtn. (18%) Ancient Larrea Rings (1%) RT & E's: None Range Cond/Trend: Good/Stable Conc. Area: Fair Stable Pop's: 25 Burros Existing Veg. Use: Burros: 148.5T/17840 ac (16.6 lb/ac) Overall Impacts: negative	Habitat conditions for most wildlife species will decline. Negative impacts to wildlife would be greatest near water sources and in riparian vegetation where burro use is concentrated. Increasing burro numbers would preclude reintroduction of Desert Bighorn.	Burro Range See Balanced Alternative for cultural resources. 25 burros will have moderate negative impacts overall and severe negative impacts at certain locations.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 19 Cave Mtn.	Impacts on UPA's: None Impacts on RT & E's: Burro Range: Androstephium breviflorum Range Cond/Trend: Good/Stable Conc. Area: Good/Stable Pop's: 5 Burros Existing Forage Use: Burros: 29.7T/13000 ac (4.6 lb/ac) Overall Impacts: negative	Habitat conditions would decline for most wildlife as burro numbers increase. Expanding populations would eventually have severe deleterious effects on riparian vegetation in the adjacent Afton Canyon ACEC and would contribute to the eventual elimination of Desert Bighorn from the Cady Mountain.	Burro Range Same as Balanced Alternative for cultural resources and impacts.
HMA 20 Morongo	Impacts on UPA's: Same as Balanced Alternative. RT & E's: None Proposed Burro Pop's: 13 Burros Proposed Veg. Use: 2.7 lb/ac Overall Impacts: low negative	Habitat conditions would decline for most wildlife as burro numbers increase. Expanding populations would eventually have severe deleterious effects on riparian vegetation in the Whitewater Canyon ACEC, one of the few areas in California where Summer Tanagers occur.	Burro Range Same as Balanced Alternative for cultural resources. 20 burros will have mild to moderate negative impacts overall on cultural resources. Burro Concentration Areas Same as Balanced Alternative for cultural resources. 20 burros will probably have moderate negative impacts overall on cultural resources.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 21 Clark Mtn.	Impacts on UPA's: Burros: Abies concolor (white fir) (10%) Calciphytes (limestone) communities (5%) Artemisia spinescens Atriplex confertifolia (30%) Shadow Valley/Cima Dome Joshua Tree Forest (20%). Concentration Areas (2%) Impacts on RT & E's: Burros: Within Conc. Areas Stipa arida Within Burro Range Also Include: Buddleja utahensis Coryphantha vivipara var. alversonii Eriogonum ericifolium thornei Tridens pilosum Oryzopsis micrantha Astragalus cimae var. cima Eriogonum heermannii floccosum Muhlenbergia arsenei Enneapogon desvauxii Fendlerella utahensis Forsellesia pungens var. glabra Range Cond/Trend: Fair/Stable Conc. Area: Fair/Declining Pop's: 325 Burros Existing Veg. Use: Burros: 1930.5T/173,100 ac (22.3 lb/ac) Overall Impact: highly negative	Wildlife habitat conditions would continue to decline for most species. Desert Tortoise densities would decline in the Ivanpah and Shadow Valley Crucial Habitat Areas. Competition with Desert Bighorn would cause reductions in sheep numbers, possibly leading to elimination. Deleterious impacts to wildlife would be greatest at water sources and in riparian habitats where burro use is greatest. Wildlife values in the Clark Mountain ACEC would be severely degraded.	Burro Range Same as Balanced Alternative for cultural resources. A herd size of 325 burros will have extremely severe negative impacts overall on cultural resources in this area. Burro Concentration Areas Same as Balanced Alternative for cultural resources. 325 burros will have extremely severe negative impacts on cultural resources overall.

TABLE HHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 22 Burro Range Indian Spring	Impacts on UPAs: Burros Atriplex confertifolia-artemism senescene (20%); Shadow vly cima dome J.T. For. (20%) Burro concentration areas (5%); Riparian area (Indian sites) (50%); burro concentration area (50%). RT&Es: within burro range: astragalus cimae var. cimae Range cont/Trend: Good/ Stable; Conc. areas: Fiar/Declining. Populations: 150 burros; existing veg. use: burros 891T/178,500 ac. (10/lb/ac). Overall Impact: Highly negative.	Wildlife habitat quality would be severely degraded. Desert tortoise populatins would decline. Desert bighorn popuations would decline; permanent range may become transient. Riparian areas including critical sheep watering areas would be severely degraded. Indian Springs ACEC would be severely degraded.	See Balanced Alterntive for cultural resources. 150 burros will likely have moderate negative impacts overall on cultural resources.
HMA 22 Burro Concentration Areas Indian Spring			See Balanced Alternative for cultural resources. 150 burros will have severe negative impacts overall on cultural rsources.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 23 Burro Range Granite Mtn	Impacts on UPAs none. Impacts on RT&Es within burro range, monardella robisonii, penstemon stephensii, range cond/trend good stable; conc. area: fair/ declining. Populations 155 burros, existing vegetatio use, burros 920.7 tons/60,000 acr. (306 lb/ac) Overall Impact: High negative.	Expanding burro populations would cause degradation of habitat conditions for most wildlife. Desert Bighorn numbers in the Granite Mountains would begin to decline and could eventually be eliminated. Wildlife populations and habitat value will decline sharply throughout the Granite Mountains Special Habitat Area. Concentration burro use areas, especially riparian habitats and water sources would be most severely degraded.	See Balanced Alternative for cultural resources. A population of 155 burros will probably have severe negative impacts overall on cultural resources.
HMA 23 Burro Concentration Areas Granite Mnt.			Same as above.

TABLE VIIB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 24 Burro Range Providence Mtn.	Impacts on UPAs within burro range, calciphythe (limestone) communities (100%) burro conc. areas (85%); RT&Es within burro range: monardella robisonii, penstemon stephensii, pengtemon calcareus; fenderella utahensis; ayenia composer; astragalus cimae var. cimae; within burro conc. areas; pendelerlla utahensis; atenia compacta; penstemin calreus; P. stephensii. Range c/t: fair - stable; conc. area - fair - declinign. Populations 195 burros existing veg. use burros 1158.3T/76,000 lwoac (30.32 lb/ac). Oerall impacts: Extremely negative	See Balanced Alternative.	Same as Balanced Alternative for cultural resources. 195 burros will have severe negative impacts on cultural resources in this area.
HMA 24 Burro Concentration AReas Providence Mtns.		See Balanced Alternative.	Same as above.

TABLE WHB-1

FERAL HORSES AND BURROS ELEMENT IMPACTS
NO ACTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 25 Burro Range Woods/Hackberry	Impacts on UPAs, horses woods/Hackberry Mtns. cacti (20%) Horse concentration areas (2%); burros Woods/Hackberry mtns. cacti (100%); burro conc. areas (50%); immense yucca schidigeras (5%). RT&Es none. Range c/t: fair/stable, conc. area; Fair/declining. Populations 12 horses, 175 burros; existing veg. use; horses 71.28T/59400 ac (2.4 lb/ac); burros 1039.5/59000 ac (35 lb/ac) Overall Impacts highly negative.	Habitat quality would decline throughout the herd management area. Desert tortoise populations would decline precipitously. Desert bighorn populations would decline; permanent and concentrated ranges may decline to seasonal. Riparian areas would be degraded severely; this includes critical sheep watering holes.	See Balanced Alternative for cultural resources. 175 burros will have severe negative impacts to cultural resources in this area overall.
HMA 25 Burro Concentration Areas Woods/Hackberry			Same as above
HMA 25 Horse Range Woods/Hackberry			See Balanced Alternative for cultural resources. 12 horses will probably have mild negative impacts overall on cultural resources in this area and moderate impacts at certain locations.
HMA 25 Horse Concentration Area Woods/Hackberry			Same as above.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 26 Burro Concentration Area Marl Spring	Impacts on UPAs none RT&Es none. range c/t; fair/stable conc. areas; fair/declining . Pops: 30 burros. exixsting veg. use, burros 178.2 T/11,500 ac. (31.0 lb/ac) Overall Impacts: Highly negative.	Habitat quality would be severely degraded throughout the herd management area. Riparian areas would be severely degraded, this would include critical watering sources for wildlife. Desert tortoise numbers would decline precipitously.	Same as Balanced Alternative for cultural resources. 30 burros are likely to have mild to moderate negative impacts on cultural resources in this area.
HMA 27 Burro Range Cut Spring	Impacts on UPAs within burro range: shadow Valley/Cima Dome Joshua Tree forest (100%) Burro conc. areas (4%). RT&Es within burro range: Astragalus cimae var. cimae. Range C/T Fair/Stable, Conc. Areas Fair/Declining Pops: 20 burros, existing veg. Use: Burros 118.8 T/4500 ac. (52 lb/ac) Overall Impact Highly neg.	Habitat quality would decline throughout the herd management area. Riparian areas would be severely degraded; this includes critical water sources for wildlife.	Same as Balanced Alternative for cultural resources. 20 burros may have mild negative impacts overall on cultural resources and perhaps moderate negative impacts at certain locations.
HMA 27 Burro Concentration ARea Cut Spring			Same as above.
HMA 28 Burro Range Piute Mtns.	Impacts on UPAs none; impacts on RT&Es none. range c/t Fair/Stable; conc. areas, Fiar/Declining. Pops: 50 burros Existing Veg use: burros 297 T/30,100 ac. (19.7 lb/ac). Overall impact Negative.		Same as Balanced Alternative for cultural resources. A population of 50 burros is likely to have moderate negative impacts on cultural resources in the area.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 28 Burro Concentration Area Piute Mtns.		Habitat quality would decline throughout the herd management area. Current desert bighorn use is transient; under this alternative they would be extirpated. Riparian areas would be severely degraded; this would include critical sheep water holes.	Same as Balanced Alternative for cultural resources. 50 burros will probably have moderate to severe negative impacts on cultural resources in this area.
HMA 29 Burro Range Dead Mtns.	Impacts on UPAs none impacts on RT&Es none. Range c/t Fair/Stable; conc. areas Fair/Declining. Pops; 50 burros. Existing veg. use; Burros 297T/48,600 ac. (12.2 lb/ac). Overall Impact Neg.	Habitat quality would decline throughout the herd management area. Current desert bighorn use as transient; under this alternatives they would be extirpated. Riparina areas would be severely degraded; this would include critical sheep water holes. Desert tortoise populations would decline rapidly	See Balanced Alternative for cultural resources 50 burros will have moderate negative impacts overall on cultural resources in this area.
HMA 30 Burro Concentration Areas Chemehuevi		Habitat quality would decline throughout the herd management area. Desert bighorn use and numbers would decline; permanent range may become seasonal and perhaps even transient. Desert tortoise populations would decline at a rapid rate. Riaprain areas would become severely degraded; this would include critical sheep water holes.	See Balanced Alternative for cultural resources. 800 burros will have severe negative impacts overall on cultural resources in this area.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 31 Horse Concentration Area Palm Canyon	Impacts on UPAs Horses Palm Oases (100%) RT&Es none; range o/t good, stable. conc. area good, stable. Pop. 6 horses Existing veg use. horses 35.6 tons/24320 (2.9 lb/ac) OverallImpacts Not Significant.	See Balanced Alternative.	See Balanced Alternative for cultural resources. 6 horses will probably have negligible to mild negative impacts on cultural resources overall.
HMA 32 Horse Range Coyote Canyon	Impacts on UPAs none, impacts on RT&Es none. Range o/t fair stable. Conc. areas flar, stable. Pops 20 hroses. Existing veg use, hroses 118.8 t/41400 ac. (5.7 lb/ac) Oerall impact Negative.	See Balanced Alternative.	Not assessed - Anza-Borrego
HMA 32 Horse Concentration ARea Coyote Canyon		Habitat quality would decline slowly as horse popualtions were used from then low population of about 20 animals. Peninsular bighorn populations would decline slightly as horse numbers increase. Riparian habitat quality would decline. Burro populations are unknonw but appear to be small and are mapped; they have an unknown effect on wildlife. To be prudent one must assume negative impacts, declining bighorn herds and quality of riparian habitats	Not assessed - Anza-Borrego

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 33 Burro Range Chuckwalla	Impacts on UPAs Burros: Fresh water, marshes (60%) burro concentration (40%). RT&Es within burro concentrationa rea; Matelea parvifolia, ditano californica, colubrina californica ayenim compacta, coryphantho vivipara. Within burro range include: Opuntia wigginsii. ditaxis adenophora.	See Balanced Alternative.	See Balanced Alternative for cultural resources. A population of 20 burros will have negligible to mild negative impacts on cultural resources in this area.
HMA 33 Burro Concentration Areas Chuckwalla		See Balanced Alternative.	See Balanced Alternative for cultural resources. A population of 20 burros is likely to have mild negative impacts overall and perhaps moderate impacts at certain locations.
HMA 34 Burro Range (outside Choc. Mtns. Naval Gunnery Range only) Chocolate Mtns.	Impacts on UPAs noen impacts on RT&Es within burro range; Opuntia munzii. Range c/t fair stable Conc. areas fair, declining. Pops 50 burros, existing veg. use burros 270 tons/92150 ac. (5.9 lb/ac) Overall Impacts Negative.	Severely negative impacts would occur to wildlife in this area. Bighorn sheep would decline in number; use would become transient. Mule deer populations would decline Riparian areas would decline rapidly in quality; wildlife depending on these areas would decline.	See Balanced Alternative for cultural resources. A herd size of 50 burros will have moderate negative impacts overall on cultural resources.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 34 Burro Concentration Area (outside Choc. Mtns. Naval Gunnery Range only) Chocolate Mtns.			Same as above.
HMA 35 Burro Range (outside Choc. Mtns. Naval Gunnery Range only) Milpitas Wash	Impacts on UPAs none, impacts on RT&Es none; range c/t fair/stable conc. area fair/stable Pops 75 burros existing veg. use: Burros 445.5 t/45,200 ac (19.7 lb/ac) Overall Impacts negative.	Habitat quality would decline throughout the management area. Desert bighorn populations would decline; use may decline to transient. Desert tortoise populations would decline. Pronghorns would not become establish if they were introduced. Riparian areas would be severely degraded; this would include critical sheep water holes.	See Balanced Alternative for cultural resources. 75 burros will result in moderate negative impacts overall on cultural resources.
HMA 36 Burro Range Picacho	Impacts on UPAs None, Impacts on RT&Es within burro range: Ditaxis adenophora, Range C/T Unknown Pops 50 burros Existing veg. Use Burros 297 T/58,000 ac (10.2 lb/ac) Overall Impacts negative.	See Balanced Alternative	See Balanced Alternative for cultural resources. A population of 50 burros will have moderate negative impacts on cultural resources in this area.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 37 = Horse Concentration Area Ash Meadows			Same as above.
HMA 37 Horse Range Ash Meadows	Impacts on UPAs Horse: RT&Es amargos riparian (1%) within horse range Nitrophila mophavensis, Cordylanthus fewpensis, range con/trend fair, stable conc. areas fair/ declining Pops 20 hroses, existing veg. use: Horse 118 8 t/118,000 ac (30.1 lb/ac) Overall Impact highly negative.	See Use Alternative	See Balanced Alternative for cultural resources. 20 horses will have mild to moderate negative impacts on cultural resources in this area.

TABLE WHB-2

FERAL HORSES AND BURROS ELEMENT IMPACTS

PROTECTION ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 1 Horse Range	Impacts on UPAs. Same as No Action RT&E's Same as No Action Proposed Pops. 32 horses 95 burros Proposed Veg. Use; Burros 59.9 lb./acre Horses 19.8 lb./acre Overall impacts: highly negative	See Balanced Alternative	See Balanced. Maintaining a 32 horse herd will have moderate overall negative impact.
HMA 1 Burro Range		See Balanced Alternative	Maintaining 94 burros will result in severe local negative impacts and moderate negative overall impacts.
HMA 1 Burro Concentration areas		See Balanced Alternative	Maintaining 94 burros will result in severe negative local impacts and moderate overall negative impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 2 Burro Range	Impacts on UPAs: Same as No Action RT&Es Same as No Action Proposed Pop's,800 Burros Proposed Veg. Use: Same as No Action Overall Impacts: Highly negative.	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Native American considerations subject to impact are: Paiute, Shoshone, Chemehuevi -Mineral collection area -Seasonal vegetative collection area -Historic village sites -Total 456 miles very high sensitivity
HMA 2 Burro Concentration Areas		See Balanced Alternative	See Balanced alternative for Cultural Resources and Impacts. The high concentration of burros allowed under this alternative has potential for impacting. The northern extent of a Paiute and Panamont Shoshone settlement area -Cinnabar, Obsidian and Pinyon collection areas -Floral items of particular traditional significance. Approx 24 sq. miles of very high sensitivity.
HMA 3 Horse Range (Outside DVNM Only)	Impacts on UPAs: None RT&Es Same as No Action. Proposed Pop's: 41 horses 142 burros Proposed Veg. Use: horses 10.2 lb./acre Burros 35.1 lb./acre Overall impacts: highly negative	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Maintaining a herd of 41 horses will result in overall low negative impacts over time and moderate local impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 3 Burro Range (outside DVNM only)		See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining 142 burros will result in moderate overall and severe local negative impacts over time. Native American resources subject to impact: -Panamint/Shoshone collection areas -Traditional collection areas -Numerous traditional occupation sites -42 sq miles of very high sensitivity.
HMA 3 Burro Concentration Areas (outside DVNM only)		See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining 142 burros will result in moderate overall and severe local negative impacts over time. Native American considerations subject to impact. -Panamint/Shoshone and Chemehuevi -Seasonal collection for both secular and ritually associated purposes -temporary camps potential to impact -Numerous areas of ritual and religious affiliation -14 sq. miles affected.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 4 Burro Concentration Area (excludes DVNM and Nevada)	Impacts on UPAs: None RT&Es Same as No Action Proposed Pop's: 160 burros Proposed Veg. Use: 321 lb./acre Overall impact; highly negative	See Balanced Alternative	See Balanced Alternative for Cultural Resources and impacts. Native American resources subject to impact. -Panamint/Shoshone -Area of ritually associated collection -Temporary and permanent campsites -Approx. 17 sq. miles of very high sensitivity
HMA 5 Burro Range	Impacts on UPAs: Same as No Action. RT&Es - None Proposed Pop's: 46 burros Proposed Veg. Use; burros 7.5 lb./acre	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts.
HMA 6 Burro Range	Impacts on UPAs: None RT&Es: None Proposed Pop's: 59 Burros Proposed Veg. Use: 32.3 lb/acre Overall impact: highly negative	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Native American concerns: -Panamint/Shoshone/Chemehuevi sensitivity area -area of seasonal collection of annual indegenous flora -Ritually and religiously significant sites distributed throughout.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 6 Burro Concentration Area		See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts.
HMA 7 Burro Range	Impaction UPA's: None RT&E's: None Proposed Pop's: 107 burros Proposed Veg. Use: Burros: 53.416/acre Overall Impacts: highly negative	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Native American concerns: -Shosone -some areas of seasonal collection -Historic occupation sites -7 sq. miles high sensitivity
HMA 7 Burro Concentration Area		See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts.
HMA 8 Burro Range (outside DVNM only)	Complete Burro elimination. Overall Impacts on Veg.: highly positive	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Native American concerns: -Panamint - Shoshone -Ritual and occupation sites -23 sq. miles of very high sensitivity

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 8 Burro Concentration Areas (outside DVNM only)		See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts.
HMA 9 Burro Range (outside DVNM only)	Complete Burro elimination. Overall impacts; highly positive	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Native American concerns: -Panamint Shoshone -Extremely sensitive spring sites and associated occupation sites -Mortuary sites and religiously significant areas distributed throughout polygon -45 sq. miles very high.
HMA 9 Burro Concentration Areas		See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts.
HMA 10 Burro Range (excludes Mojave "B" Range)	Same as No Action	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Native American concerns: -Kitanemuk, Kawaiisu -Seasonal camps and collection areas

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 11 Burro Range (excludes China Lake NWC)	Impacts on UPA's: None Impacts on RT&E's Proposed Pop's: 975 burros. Proposed Veg. Use: 89.8 lb./ace Overall Impacts: highly negative.	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Native American considerations: -Shoehone/Paiute -seasonal collection areas -Temp. camps
HMA 12 Burro Range	Impacts on UPA's Same as No Action. RT&E's; Same as No Action Proposed Pop's: 250 Horse 39 Burros Proposed Veg. Use; Burros 1.4 lb/acre Horses 9.2 lb./acre Overall impacts: low negative	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts.
HMA 12 Horse Range (excludes China Lake NWC)		See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. Shoshone/Paiute -Summer village sites -Ritually associated collection areas and rock art localities -40 sq. miles high sensitivity -scattered mortuary sites

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 13 Burro Concentration Area	Same as No Action	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. -Seasonal collection area and temporary campsite localities -Mohave, Chemehuevi and some use by Panamint - Shoshone -Trail network running NW/SE and E/W
HMA 14 Burro Range	No Data Available	See Balanced Alternative	Impacts not assessed. Wholly within Mojave "B" Range Naval Weapons Center. -Kitanemuk/Serrano -Large seasonally occupied -Village site -Trail system -Quarry site -Rock art -Peck art N/W range -20 Sq. miles high sensitivity
HMA 15 Burro Range	No Data Available	See Balanced Alternative	Impacts not assessed wholly within Mojave "B" Range Naval Weapons Center.
HMA 16 Burro Range (excludes Edwards AFB)	Complete burro elimination. Overall impacts: highly positive.	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts. -Scattered temp. campsites -isolated rock art localities

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 17 Burro Range	No Data Available	See Balanced Alternative	See Balanced Alternative for Cultural Resources and Impacts.
HMA 18 Burro Range	Impacts on UPA's: Same as No Action RT&E's: None Proposed Pop's: 25 burros. Proposed Veg Use: Burros 16.6 lb./acre Overall impacts: negative.	Habitat condition would continue to decline for most wildlife species in burro concentration areas, especially at water sources and in riparian habitats where burro use is concentrated. Proposed burro numbers may preclude reintroduction of Desert Bighorn.	Same as Balanced Alternative although herd increases by 12. -Serrano territory -Scattered temporary camps and collection reas. -Isolated rock art and trail system sites. -11 sq. miles very high
HMA 19 Burro Range	Same as No Action	See Balanced Alternative	Same as Balanced Alternative. -Mohave and Chemehuevi -Hunting and collection areas -North south running aboriginal trail -8 sq. miles very high
HMA 20 Burro Range	Impacts on UPA's: Burro: Palm Oasis (3%) RT&e's: None Range cond/trend: good/stable Conc. area: good/stable Pop's: 20 burros Existing Veg. Use: Burros: 118.8 tons/57,1000 acres (4.2 lb./acre) Overall impacts: negative	See Balanced Alternative	Same as Balanced Alternative. -Cahuilla/Serrano -High concentration of permenant village sites, associated mortuary and rock art sites -Extensive localities of ritual uses and religious association -81 sq. miles very high

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 20 Burro Concentration Areas		See Balanced Alternative	Same as Balanced Alternative
HMA 21 Burro Range	Impacts on UPA's: Same as No Action RT&E's: Same as No Action Proposed Pop's: 180 burros Proposed Veg. Use: 12.4 lb./acre Overall impact: negative	See Balanced Alternative	Refer to Balanced Alternative for Cultural Resources and Impacts. -Spring/fall seasonal collection area -Numerous seasonally occupied occupation sites -Some associated mortuary site Ritually associated collection and nature areas -108 sq. miles very high
HMA 21 Burro Concentration Areas		See Balanced Alternative	Refer to Balanced Alternative for Cultural Resources and Impacts.
HMA 22 Burro Range	Impacts on UPA's: Same as No Action. RT&E's: Same as No Action. Proposed Veg. Use: 6.5 lb./acre Overall Impacts: negative.	See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining a herd of 98 burros will result in moderate overall and severe local negative impacts over time. -Several historic campsites at seasonal springs -Extensive/seasonally exploited collection areas -21 sq. miles very high

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 22 Burro Concentration Areas		See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining a herd of 98 burros will result in moderate overall and severe local negative impacts over time.
HMA 23 Burro Range	Impacts on UPA's: none RT&E's: Same as No Action Proposed Pop's: 107 burros. Proposed Veg. Use: 18.4 lb. /acre Overall impacts; negative.	See Balanced Alternative	Same as Balanced Alternative. -Chemehuevi/30 Mohave -seasonal occupation and exploitation -100 sq. miles very high
HMA 23 Burro Concentration Areas		See Balanced Alternative.	Same as Balanced Alternative
HMA 24 Burro Range	Impacts on UPA's and RT&E's: Same as No Action. Proposed pop's: 144 burros Proposed Veg. Use: 22.4 lb. /lb. acre. Highly negative.	See Balanced Alternative	Same as Balanced Alternative. -Chemehuevi/Mohave (1) -Seasonally occupied village sites -Hunting and collection areas -Some ritually associated features and locations -74 sq. miles very high

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 24 Burro Concentration Areas		See Balanced Alternative	Same as Balanced Alternative.
HMA 25 Burro Range	Impacts on UPA's and RT&E's; Same as No Action. Proposed Pop's; 6 horses 115 burros Proposed veg. Use: Burros: 23 lb./acre Horses: 1.2 lb./acre Overall Impacts: Highly negative.	See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining a herd of 115 burros will result in overall severe negative impacts. -Chemehuevi/Paiute -Hunting/collectiona nd seasonal occupation -scattered areas of ritual significance -28 sq. miles very high sensitivity
HMA 25 Burro Concentration Areas		See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining a herd of 115 burros will result in overall severe negative impacts.
HMA 25 Horse Range		See Balanced Alternative	Same as Balanced Alternative.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 25 Horse Concentration Area		See Balanced Alternative	Same as Balanced Alternative.
HMA 26 Burro Concentration Area	Impacts on UPA's and RT&E's; None. Proposed pop's.; 21 burros. Proposed Veg. Use; 21.7 lb. /acre. Overall impacts: negative.	See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining a herd of 21 burros will result in low to moderate impacts over time. Low to moderate impact on areas of Native American value.
HMA 27 Burro Range	Impacts on UPA's and RT&E's. Proposed Pop's.: 14 burros. Proposed Veg. Use: 37.0 lb. /acre Overall impacts: highly negative.	See Balanced Alternative	Same as Balanced Alternative. -Chemehuevi/Paiute seasonal occupation -Low to Moderate impact on seasonally exploited resources -11 sq. miles high sensitivity
HMA 27 Burro Concentration Area		See Balanced Alternative	Same as Balanced Alternative.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 28 Burro Range	Impacts on UPA's and RT&E's; None Proposed Pop's; 32 burros. Proposed Veg. Use: 12.6 lb /acre. Overall impact; low negative.	Habitat quality would decline in much of the herd management area. Current desert bighorn use is transcent, under this alternative they would be exterpated but the period for extirpation would be longer. Riparian areas would be severely degraded, this would include critical sheep water holes.	See Balanced Alternative for Cultural Resources. Maintaining a herd of 32 burros will result in low overall and moderate local negative impacts over time. -Chemehuevi/Paiute -Temporary and permanent occupation areas -Hunting and collection areas -40 sq. miles very high
HMA 28 Burro Concentration		See Balanced Alternative	See Balanced Alternative for Cultural Resources. Maintaining a herd of 32 burros will result in low/moderate overall negative and severe local (2 sites) impacts. Same as 28a
HMA 29 Burro Range	Impacts on UPA's and RT&E's; None Proposed Pop's; 35 burros. Proposed veg. Use: 8.6 lb. /acre. Overall impact; negative	See Balanced Alternative	Same as Balanced. -Chemehuevi/Mohave/Panamint-Shoshone -Hunting and collection (seasonal use) -Numerous large campsites and villages -Areas of mythic association and specific locations of ritual use -51 sq. miles very high

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 29 Burro Concentration Area		See Balanced Alternative	Same as Balanced.
HMA 30 Burro Range	Impacts on UPA's and RT&E's; Same as No Action Proposed Pop.; 320 burros. Proposed Veg. Use; 15.0 lb/acre Overall impact: negative	See Balanced Alternative	Same as Balanced. -Mohave/Chemehuevi use -Hunting and collection activities --Numerous areas of specific religious and ritual affiliation and use -200 sq. miles very high
HMA 30 Burro Concentration Area		See Balanced Alternative	Same as Balanced.
HMA 31 Horse Concentration Area	Impacts on UPA's and RT&Es; Same as No Action. Proposed Pop's; 2 horses Proposed Veg. Use: 1.0 lb. /acre. Overall impacts: no significant impact.	See Balanced Alternative	Same as Balanced. Cahuilla -area of traditional seasonal use for both collection or hunting -Numerous specific ritual sites of contemporary use distributed throughout polygon -specific sites of religious affiliation -30 sq. miles very high

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 32 Horse Range	Complete elimination of horses. Overall impacts to vegetation; Positive.	See Balanced Alternative	Not assessed. Within new boundaries of Anza-Borrego Desert State Park. -Cohuilla -Very high sensitivity (64 sq. miles) -extensive occupation hunting and ritual sites.
HMA 32. Horse Concentration Area		See Balanced Alternative	Not assessed - within new boundaries of Anza-Borrego Desert State Park
HMA 33 Burro Range	Impacts on UPA's and RT&E's; Same as NO Action Proposed Pop's; 16 Burros Proposed Veg. Use: 0.4 lb. /acre Overall Impacts; not significant	See Balanced Alternative	Same as Balanced. -Cohuilla/Serrano territory -Numerous temporary and permenent campsites with occupation continuing through historic period -particular sensitivity of rock ant sites 120 sq. miles very high

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 33 Burro Concentration Area		See Balanced Alternative	Same as Balanced.
HMA 34a Burro Range (Excludes Chocolate Mountain Naval Gunnery Range)	Complete burro elimination. Overall Impacts: positive	See Balanced Alternative	Same as Balanced. -Yuan/Mohave -Scattered temporary camps and areas of moderate/high sensitivity -41 sq. miles moderate to high sensitivity
HMA 34 Burro Concentration Area (excludes Chocolate Mtns. Naval Gunnery Range)		See Balanced Alternative	Same as Balanced.
HMA 35	Complete burro elimination. Overall impact: positive	See Balanced Alternative	Same as Balanced. -Chemehuevi -Large permanent village, burials, ritual and religious sites. -some contemporary use. collection/hunting/ritual -43 sq. miles moderate to very high

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 36 Burro Range	Same as No Action Proposed Pop's. 40 burros. Proposed Veg. Use; 8.2 lb. /acre Overall Impacts; negative	See Balanced Alternative	Same as Balanced. -Yumon -several specific sites of ritual and religious significance including Quartz Peak area -Occasional contemporary use for ritual collection -41 sq. miles moderate to high
HMA 37 Horse Range	Impacts on UPA's and RT&E's: Same as no Action. Proposed Pop's.; 17 horses. Proposed Veg. Use: 1.7 lb. /acre Overall Impact: low negative.	See Balanced Alternative	Same as Balanced. -Panamint Shoshone -Temporary camps and contemporary traditional collection localities -41 sq. miles moderate to very high
HMA 37 Horse Concentration Area		See Balanced Alternative	Same as Balanced.

Table WHB-3

FERAL HORSES AND BURROS ELEMENT IMPACTS
BALANCED ALTERNATIVE

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES[a]
HMA 1 Horse Range	Impacts on UPAs same as No Action, RT&Es same as No Action, Proposed populations 30 horses, 87 burros; proposed vegetation use burros 53.6 lb/acre, horses 18.4 lb/acre; overall impacts: Highly negative.	Habitat quality would decline in the northern portion of the Last Chance Mountains. Desert Bighorn range causing decreasing use and possible reduction in herd numbers. Riparian habitats available sources would be severely degraded including Desert Bighorn watering holes, Black Toad habitats, Cottonwood Creek riparian zone and others. Mule Deer populations would decline. (See Appendices 3-EIA-1, 2 for specific species, range and concentration potentially impacted in this HMA. This table immediately follows Table WHB-3.)	3 miles^2 of very high and 41 miles^2 of high sensitivity, 43 miles^2 of high to very high potential for buried sites and 325 prehistoric/ historic sites are predicted for this area. Maintaining a 30 horse herd will have moderate overall negative impacts.
HMA 1 Burro Range			38 miles^2 of very high and 11 miles^2 of high sensitivity, 36 miles^2 of high to very high potential for buried sites, and 1540 prehistoric/ historic are predicted for this area. Maintaining 87 burros wil result in severe negative impacts to specific sites and moderate negative impacts overall.

[a] the number of prehistoric/historic sites predicted within each HMA are minimum figures, i.e., at least this number of sites is predicted.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 1 Burro Concentration Area		Burro concentration areas would potentially impact 13,500 acres of Prairie Falcon habitat and 1 site of the Pallid Kangaroo Mouse.	14 miles^2 of high to very high buried site potential and 75 prehistoric/historic sites are predicted. Maintaining 87 burros will result in severe negative impacts to sensitive sites and moderate negative impacts overall.
HMA 2 Burro Range	Impacts on UPAs same as No Action; RT&Es same as No Action; proposed populations 800 burros; proposed vegetation use same as No Action; overall impacts: Highly negative.	The impact of all alternatives would be that valuable mesquite habitat adjacent to Salt Lake will continue to be degraded, probably to the point of elimination. Desert Bighorn Sheep will compete with burros at important water sources; burros will destroy valuable riparian habitat leading to continuing declines in the Inyo Mountains, and Hunter Mountain herds. Ten of the twelve known Inyo Mountain Salamander populations could be eliminated by heavy burro use at water sources in the Inyo Mountains. (See Appendix 3-EIA-3 for specific species, range and concentration potentially impacted in this HMA.)	36 miles^2 of very high and 94 miles^2 of high sensitivity, 174 miles^2 of high to very high buried site potential, and 3300 sites are predicted for this area. A herd of 800 burros will result in severe negative impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 2 Burro Concentration Areas			21 miles^2 of very high and 17 miles^2 of high sensitivity, 32 miles^2 of high to very high buried site potential and 570 prehistoric/historic sites are predicted within these areas. Negative impacts will be severe (especially in two particularly significant areas) from managed population of 800 burros.
HMA 3 (Outside DVNM only) Horse Range	Impacts on UPAs none; RT&Es same as No Action; proposed populations 39 horses, 109 burros; proposed vegetation use horses 9.7 lb/acre, burros 27 lb/acre; overall impacts: Highly negative.	Impacts to wildlife in the Balanced, Protection, and Use Alternatives would be that habitat quality would improve relative to present conditions. However, competition occurring in burro concentration areas and at springs would prevent Desert Bighorn numbers from rising to pre-burro numbers. Heavy burro use at water sources would also have deleterious effects on riparian vegetation and the numerous species dependent on this habitat. (See Appendix 3-EIA-4 for specific species, range and concentration potentially impacted in this HMA.)	6 miles^2 of very high and 12 miles^2 of high sensitivity, 32 miles^2 of high to very high buried site potential, and 725 prehistoric/historic sites are predicted. Maintaining a herd of 39 horses will result in moderate negative impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 3 (outside DVNM only) Burro Range		(See Apendix 3-EIA-5 for specific species, range, and concentration potentially impacted in this HMA.)	3 miles^2 of very high and 12 miles^2 of high sensitivity, 19 miles of high to very high potential for buried sites, and 310 historic/ prehistoric sites are predicted. Maintaining 109 burros will result in moderate to severe negative impacts.
HMA 3 (outside DVNM only) Burro Concentration Areas			2 miles^2 of very high and 11 miles^2 of high sensitivity and 230 prehistoric/ historic sites are predicted for area. 40% of area has high to very high potential for buried sites. Maintaining 109 burros especially in 2 very significant sub-areas will result in severe negative impacts overall.
HMA 4 (excludes DVNM and Nevada) Burro Concentration Area	Impacts on UPAs none; RT&Es same as No Action; proposed populations 145 burros; proposed vegetation use 29.1 lb/acre; overall impact: Highly negative.	The Balanced, Protection, and Use Alternatives would cause habitat coditions for most wildlife to be improved relative to the existing situation, but would remain in poor condition due to the high burro numbers. Competition with Desert Bighorn Sheep and Mule Deer would occur at springs, riparian vegetation would be degraded, and Desert	2 miles^2 of very high and 11 miles^2 and 725 prehistoric/ historic sites are predicted in the area. One general location is currently being impacted. Maintaining 145 burros will continue the moderate overall and severe local impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
		Bighorn populations would not be able to rise to pre-burro numbers. (See Appendix 3-EIA-6 for specific species, range and concentration potentially impacted in this HMA.)	
HMA 5 Burro Range	Impacts on UPAs same as No Action; RT&Es none; proposed populations 45 burros; burros 7.3 lb/acre.	Habitat conditions for most wildlife would be improved relative to the existing situation, but would remain in poor or fair condition due to the planned high burro numbers in the Balanced, Protection, and Use Alternatives. About 13,000 acres of Prairie Falcon habitat, 1 site inhabited by the Pallid Bat and 14,000 acres of the Flat Shadscale Scrub habitat would be impacted.	1 mile^2 of very high and 1 mile^2 of high sensitivity. 80 miles^2 of high to very high probability of buried sites, and at least 725 prehistoric/historic sites are predicted. One extremely important site complex is an edge of area. Reduction of herd to 45 will result in moderate negative impacts overall.
HMA 6 Burro Range	Impacts on UPAs none; RT&Es none; proposed populations 56 burros; proposed vegetation use 30.7 lb/acre; overall impact: Highly negative.	In the Protection and Balanced Alternatives, reductions in burro numbers would improve wildlife habitat relative to existing conditions, but planned numbers would be high enough to prevent the range from recovery to a pre-existing condition. Negative impacts on wildlife will be greatest at water sources where riparian	1 mile^2 of very high and 6 miles^2 of high sensitivity and at least 300 historic/prehistoric sites are predicted in the area. Maintaining 56 burros will result in severe negative impacts to individual loci (presently severe) and moderate negative impacts overall.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
	vegetation would be destroyed by overutilization and trampling, and springs would be fouled. Over 9,500 acres of desert bighorn transient range, 13,500 acres of mule deer habitat and 640 acres of the Black Springs ACEC would be potentially impacted.		
HMA 6 Burro Concentration Area		In the concentration area over 5,000 acres of bighorn, 8,300 acres of mule deer habitat and 640 acres of the Black Springs ACEC would be impacted.	1 mile^2 of very high and 1 mile^2 of high cultural sensitivity and 100 sites are predicted. Maintaining 56 burros will result in severe negative impacts through time (currently severe) to the total area.
HMA 7 Burro Range	Impacts on UPAs none; RT&Es none; proposed populations 101 burros; proposed vegetation use burros 53.4 lb/acre; overall impacts: Highly negative.	Habitat conditions would decline for most wildlife. High burro numbers in the northern end of the Argus Range would contribute to Desert Bighorn declines throughout the mountain range, possible leading to elimination of this Desert Bighorn herd. Deleterious impacts on wildlife will be greatest at water sources and where riparian vegetation is degraded. This applies for all alternatives. Over 5,000 acres of desert bighorn habitat (3,800 acres of seasonal and 1,300 acres of permanent range) would be impacted.	2 miles^2 of very high and 6 miles^2 of high cultural sensitivity, 1 mile^2 high potential for buried sites and at least 225 historic/prehistoric sites are predicted. Maintaining 101 burros will result in severe overall negative impacts through time.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 7 Burro Concentration Area		The concentration area would cause impacts to 4,500 acres of bighorn habitat (1300 permanent and 3,200 seasonal).	1 mile^2 of very high and 2 miles^2 of high sensitivity and 125 prehistoric/ historic sites are predicted. Maintaining a herd of 10 burros will result in severe overall negative impacts.
HMA 8 Burro Range (outside DVNM only)	Same as Protection.	Wildlife habitat would slowly begin to recover from the existing poor and declining condition. As recovery occurs, most wildlife populations would begin returning to pre-burro levels. This would occur in the Balanced, Protection and Use Alternatives. (See Appendix 3-EIA-7 for specific species, range and concentration potentially impacted in this HMA.)	20 miles^2 of very high sensitivity, 58 miles^2 of high to very high probability for buried sites and 500 historic/ prehistoric sites are predicted. Many known significant site. Total burro removal will result in positive overall impacts.
HMA 8 Burro Concentration Area (outside DVNM only)	–	(See Appendix 3-EIA-8 for specific species, range and concentration potentially impacted in this HMA.)	20 miles^2 of very high sensitivity, 58 miles^2 of high to very high probability for buried sites and at least 500 historic/prehistoric sites are predited. Many known significant sites. Total burro removal will result in positive overall impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 9 Burro Range (outside DVNM only)	Same as Protection.	Wildlife habitat would slowly begin to recover from the existing poor and declining condition. As recovery occurs, most wildlife populations would begin returning to pre-burro levels in the Balanced, Protection, and Use Alternatives. (See Appendix 3-EIA-9 for specific species, range and concentration potentially impacted in this HMA.)	9 miles^2 of very high and 10 miles^2 of high sensitivity, 27 miles^2 of high to very high potential for buried sites, 12 linear miles of historic trails and 1400 prehistoric/ historic sites are predicted. Total removal of burros will result in overall positive impacts.
HMA 9 Burro Concentration Areas (outside DVNM only)		(See Apendix 3-EIA-10 for specific species, range and concentration potentially impacted in this HMA.)	4 miles^2 of very high and 3 miles^2 of high sensitivity, 1 square mile of high potential for buried sites, and 200 sites are predicted for area. Total removal will result in overall positive impacts.
HMA 10 Burro Range (Outside Mojave "B" range only)	Same as No Action.	All alternatives would have the following impacts: Maintaining burros at a level already known to result in fiar and declining habitat condition and trend would lead to further declines in habitat condition, wildlife population numbers, and species diversity. Negative impacts on wildlife would be greatest near water sources and in riparian habitats. Cumulative	2 miles^2 of very high and 6 miles^2 of high sensitivity, and 225 sites are predicted. Maintaining a herd of 218 burros will continue the present severe impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
		impacts of burros to range condition and to water sources could prevent movement of Desert bighorn between the Argus Range and Panamint Mountains via the Slate Range. 30,000 acres of bighorn habitat, 4,500 ares of Golden Eagle habitat, and 4,500 acres of Prairie Falcon habitat would be impacted.	
HMA 11 Burro Range (outside Chinalake NWC only)	Same as Protection.	All alternatives would have the following impacts: Habitat conditions would decline for most wildlife. High burro numbers would contribute significantly to the eventual elimination of Desert Bighorn in the Argus Range. Foraging and nesting areas of the Inyo Brown Towhee would be severely degraded; official listing by the Office of Endangered Species would become highly probable. All riparian habitats and water sources would be seriously damaged. (See Appendix 3-EIA-11 for specific species, range and concentration potentially impacted in this HMA.)	15 miles^2 of very high and 16 miles^2 of high sensitivity, 25 miles^2 of high to very high potential for buried sites, 28 linear miles of historic trails and 1150 sites are predicted. Maintaining 975 burros will result in severe negative impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 12 Burro Range	Impacts on UPAs same as No Action; RT&Es same as No Action; proposed populations 239 horses, 26 burros; proposed vegetation use burros 94 lb/acre, horses 8.6 lb/acre; overall impacts: Low negative.	The following impacts are predicted under the Balanced, Protection and Use Alternatives: Wildlife habitat conditions would be generally improved. Proposed reductions would be large enough to contribute to the slow recovery of Desert Bighorn population, riparian vegetation and Inyo Brown Towhee. However, proposed burro and horse management levels are high enough that competition and habitat degradation at water sources most heavily used by burros and horses could cause severe site specific impacts. (See Appendix 3-EIA-12 for specific species, range, and concentration potentially impacted in this HMA.)	Not assessed, wholly within China Lake NWC.
HMA 12 Horse Range (outside China Lake NWC only)		(See Appendix 3-EIA-13 for specific species, range and concentration potentially impacted in this HMA.)	14 miles^2 of very high and 27 miles^2, 66 miles^2 of high to very high potential for buried sites, 60 linear miles of historic trails, and 3475 historic and prehistoric sites are predicted. Maintaining 239 horses will result in moderate negative impacts overall.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 13 Burro Concentration Area	Same as No Action.	In the Protection, Balanced and Use Alternatives habitat condition in the Chicago Valley Mesquite Thicket Special Habitat Area would continue to decline. Desert Bighorn in the Nopah Range would not be severely impacted if burro population are held constant. (See Appendix 3-EIA-14 for specific species, range and concentration potentially impacted in this HMA.)	21 miles^2 of very high sensitivity, 25 miles^2 of high to very high probability for buried sites, and 200 prehistoric/ historic sites are predicted. One very important known site is currently being heavily impacted. Herd stability would result in overall low negative impacts.
HMA 14 Burro Range	No Data Available.	Range conditiona nd trend and population estimates are unknown. Maximum impacts on wildlife and their habitats are assumed. Desert Bighorn populations may decline. Permanent range may become seasonal and use in concentration areas may decline. Tortoise numbers would decline and riparian areas would decline in quality. These impacts apply to all alternatives. (See Appendix 3-EIA-15 for specific species, range and concentration potentially impacted in this HMA.)	Impacts not assessed, wholly within Mojave "B" Range Naval Weapons Center.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 15 Burro Range	No Data Available.	No Data Available.	Impacts not assessed, wholly within Mojave "B" Range Naval Weapons Center
HMA 16 Burro Range (outside Edwards AFB only)	Same as Protection.	Burro removal would contribute towards an excellent and improving habitat condition, and increased Desert Tortoise densities in all but the No Action Alternative. Improvement would occur on 11,500 acres of the Fremont-Stoddard Tortoise crucial habitat and 5,100 acres of other tortoise habitat.	10 miles^2 of high buried site potential and about 10 prehistoric sites are predicted. Herd removal would have positive impacts.
HMA 17 Burro Range	No Data Available.	No Data Available.	The predicted 25 prehistoric sites and known historic trails have already been partially impacted. Minimal impacts are expected by burros. However, unknown until projected herd size is proposed.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 18 Burro Range	Impacts on UPAs same as No Action; RT&Es none; proposed populations 13 burros; proposed vegetation use 8.7 lb/acre; overall impact: Low negative.	Habitat conditions in burro concentration areas would remain in a degraded condition, especially around water sources and in riparian vegetation when burro use is highest. Proposed burro numbers may be high enough to preclude reintroduction of Desert Bighorn. (See Appendix 3-EIA-16 for specific species, range and concentration potentially impacted in this HMA.)	1 mile^2 of very high and 2 miles^2 of high sensitivity, 100% of area has high probability for buried sites, one California Point of Historical Interest, 80 prehistoric/historic sites are known or predicted. Reduction of herds to 13 burros will result in moderate negative impacts overall and severe impacts to 2 particular sites over time.
HMA 19 Burro Range	Same as No Action.	In the Balanced and Protection Alternatives habitat would remain in current condition, good and stable. Competition may occur between burros and Desert Bighorn in the extreme north end of the Cory Mountains but should be removed due to the second Desert Bighorn use, small areas of overlap and small burro land. 2,500 acres of seasonal desert bighorn habitat, 3,200 acres of the Cady Mtns. Bighorn Sheep habitat area and 320 acres of yellow-breasted Chat habitat would be impacted.	2 miles^2 of high sensitivity, 100% of area has high potential for burried sites, and 100 prehistoric/historic sites are predicted. 8 linear miles of historic trails and several aboriginal trails are known in area. Reduction of herd to 5 burros will result in low overall negative impacts over time. Local impacts to aboriginal trails are assessed to be moderate over the planning horizon.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 20 Burro Range	Same as Protection.	In all but the No Actin Alternative, habitat conditions would generally improve, but specific sites such as water sources and riparian habitats would be negatively affected. (See Appendix 3-EIA-17 for specific species, range and concentration potentially impacted in this HMA.)	6 miles^2 of very high sensitivity, 38 miles^2 of high sensitivity and at least 325 prehistoric/ historic sites are predicted. The small maintained number of burros will have a low overall negative impact.
HMA 20 Burro Concentration Area		(See Appendix 3-EIA-18 for specific species, range and concentration potentially impacted in this HMA.)	2 miles^2 of very high and 17 miles^2 of high sensitivity, and at least 120 prehistoric/historic sites are predicted. Negative impacts from the small maintained herd are assessed to be low over the planning horizon.
HMA 21 Burro Range	Impacts on UPAs same as No Action; RT&Es same as No Action; proposed populations 143 burros; proposed vegetation use 9.8 lb/acre; overall impact: Negative.	In all but the No Action Alternative wildlife habitat conditions would continue to decline for most species. Desert tortoise densities would decline int he Ivanpah and Shadow Valley crucial habitat areas. Desert bighorn populations would continue to decline, permanent range may be used only in a transient manner. Impacts on wildlife would be greatest in riparian habitats where burro use is greatest. Wildlife values in	109 miles^2 of very high and 28 miles^2 of high sensitivity, 164 miles^2 of high potential for buried sites, 54 linear miles of historic trails and 825 prehistoric/ historic sites are known or predicted. Reduction of herd to less than half of the estimated present population would still likely result in severe negative impacts overall and severe negative impacts at certain locations.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
		Clark Mountain ACEC would be degraded. (See Appendix 3-EIA-19 for specific species, range and concentration potentially impacted in this HMA.)	
HMA 21 Burro Concentration Areas		(See Appendix 3-EIA-20 for specific species, range and concentration potentially impacted in this HMA.)	20 miles^2 of very high and 8 miles^2 of high sensitivity, 44 miles^2 of high potential for buried sites, 18 linear miles of historic trails and 275 prehistoric and historic sites are known or predicted. Depending on the area of concentration used by the burros, negative impacts will range from moderate to severe overall with severe impacts likely at 2 loci.
HMA 22 Burro Range	Impacts on UPAs same as No Action; RT&Es same as No Actin; proposed populations 66 burros; proposed vegetation use 4.4 lb/acre; overall impacts: Negative.	Wildlife habitat quality would be degraded. Desert tortoise populations would decline. Desert bighorn populations would decline. Riparian areas including critical sheep watering areas would be degraded. Indian Springs ACEC would be degraded. This applies to all but the No Action Alternative. (See Appendix 3-EIA-21 for specific species, range and concentration potentially impacted in this HMA.)	22 miles^2 of very high and 98 miles^2 of high sensitivity, 164 miles^2 of high buried site potential, 54 linear miles of historic trails, and 825 prehistoric/ historic sites are known or predicted. A reduced herd of 66 burros will result in low to moderate overall negative impacts. Particular sites however wil continue to receive severe negative impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 22 Burro Concentration Areas		A Golden Eagle nest and 3,000 acres of the Indian Springs ACEC would be impacted.	20 miles^2 of high sensitivity, 36 miles^2 of high potential for buried sites, and 350 prehistoric/historic sites are known or predicted. A reduced herd of 66 burros would have a low to moderate negative impact over time (currently moderate to severe). Severe negative impacts would continue at particular severe sites.
HMA 23 Burro Range	Impacts on UPAs none; RT&Es same as No Action; proposed populations 113 burros; proposed vegetation use 19.4 lb/acre; overall impacts: Negative.	Wildlife habitat would remain in a degraded condition. Burro concentration areas including riparian habitats and water sources would be severely deteriorated. Competition would still occur between burros and Desert Bighorn, possibly holding Bighorn populations at reduced numbers. This applies to all but the No Action Alternative. (See Appendix 3-EIA-22 for specific species, range and concentration potentially impacted in this HMA.)	16 miles^2 of very high and 34 miles^2 of high sensitivity, 60 miles^2 of high potential for buried sites, and 650 prehistoric/historic sites are known or predicted. Reduction of the present burro population to 113 animals would still result in moderate to severe negative impacts overall and probably severe negative impacts at certal locations.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 23 Burro Concentration Areas			13 miles^2 of very high and 10 miles^2 of high sensitivity, 18 miles^2 of high potential for buried sites, and 225 prehistoric/historic sites are predicted or kown. Despite burro reduction, severe negative impacts to cultural resources are likely to occur.
HMA 24 Burro Range	Impacts on UPAs and RT&Es same as No Action; proposed populations 135 burros; proposed vegetation use 21.0 lb/acre; overall impacts: Highly negative.	In the No Action, Protection, and Balanced Alternatives, habitat conditions for most wildlife species would declinesharply. Desert Bighorn populations in the Providence Mountains would begin to decline and could eventually be eliminated. Mule Deer numbers would decline. Concentrated burro use at springs and in riparian habitats would cause severe degradation of these valuable habitats. (See Appendix 3-EIA-23 for specific species, range and concentration potentially impacted in this HMA.)	26 miles^2 of very high and 50 miles^2 of high sensitivity, 110 miles^2 of high to very high buried site potential, and 1100 prehistoric/historic sites are known or predicted. Herd reduction to 135 burros will continue to result in severe negative impacts, especially at certain locations.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 24 Burro Concentration Areas			12 miles^2 of very high and 18 miles^2 of high sensitivity, 48 miles^2 of high to very high buried site potential, and at least 800 prehistoric/historic sites are known or predicted. Herd reduction is not sufficient to lessen the severe negative impacts that are occurring to cultural resources.
HMA 25 Burro Range	Impacts on UPAs and RT&Es same as No Action; proposed populations 4 horses, 79 burros; proposed vegetation use burros 15.8 lb/acre, horses 0.8 lb/acre; overall impacts: Negative.	In all but the No Action Alternative habitat quality would decline in parts of the management areas. Riparian area especially bighorn waterholes would be degraded. Desert tortoise populations would decline. Desert bighorn populations would decline. (See Appendix 3-EIA-24 for specific species, range and concentration potentially impacted in this HMA.)	16 miles^2 of very high and 23 miles^2 of high sensitivity, 73 miles^2 of high to very high buried site potential, and 540 prehistoric/ historic sites are known or predicted. Overall impacts would be moderate with locally severe impacts.
HMA 25 Burro Concentration Areas			8 miles^2 of very high and 8 miles^2 of high sensitivity, 30 miles^2 of high to very high buried site potential, and 235 prehistoric/ historic sites are known or predicted. Impacts same as above.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 25 Horse Range		(See Appendix 3-EIA-25 for specific species, range and concentration potentially impacted in this HMA.)	3 miles^2 of very high and 11 miles^2 of high sensitivity, 28 miles of high to very high buried site potential, 4 miles of historic trails, and 275 prehistoric/historic sites are known or predicted. Maintaining 4 horses will have negligible overall negative impacts.
HMA 25 Horse Concentration Area			2 miles^2 of very high sensitivity/ significance and 3 miles^2 of high sensitivity/ significance plus 12 miles^2 of high to very high buried site potential are present in the area. At least 100 sites are kown or predicted as well. Herd size of 4 horses is likely to have negligible negative impacts on cultural resources.
HMA 26 Burro Concentration Area Marl Spring	Impacts on UPAs and RT&Es none; proposed populations 15 burros; proposed vegetation use 15.5 lb/acre; overall impacts: Negative.	In the Balanced and Protection Alternative habitat quality would be degraded in certain heavily used areas. Riparian areas would be degraded; thus would include critical watering sources for wildlife. Desert Tortoise numbers would decline. About 9,500 acres of tortoise habitat, 3800 acres of Golden Eagle and 3800 acres of Prairie Falcon habitat would be subject to impacts.	3 sq. miles of high cultural resource sensitivity/significance and 15 sq. miles of high to very high buried site potential plus 4 linear miles of significant historic roads/trails are present. A minimum of 35 sites are known and/or predicted as well. Reduction of the burro population to 5 animals would be positive by reducing the negative impacts to a low level.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 27 Burro Range Cut Spring	Impacts on UPAs and RT&Es proposed populations 10 burros; proposed vegetation use 26 lb/acre; overall impacts: Negative.	In all but the No Action Alternative habitat would decline in heavy use areas. Riparian areas would be degraded, this includes critical water sources for wildlife. (See Appendix 3-EIA-26 for specific species, range and concentration potentially impacted in this HMA.)	2 square miles of high cultural resource sensitivity/significance and 25 square miles of high to very high buried site potential are present in the area. A minimum of 250 sites are known or predicted in the area. Reduction of the burro population to 10 animals would reduce negative impacts to cultural resources to a low to negligible level.
HMA 27 Burro Concentration Area			2 square miles of high cultural resource sensitivity/significance and 10 square miles of high to very high buried site potential are present in the area. A minimum of 40 sites are known or expected in the area. The population levels proposed are expected to have low to negligible negative impacts on cultural resources.
HMA 28 Burro Range Piute Mtns.	Impacts on UPAs and RT&Es none; proposed populations 13 burros; proposed vegetation use 5.1 lb/acre; overall impact: No significant impact.	Habitat quality would decline slightly in much of the herd management areas. Desert bighorn use would remain transitory however use levels would decline over time. Riparian areas would be degraded but many show some recovery; this would include critical sheep waterholes.	3 square miels of very high and 2 square miles of high cultural resource sensitivity/significance are present in the area. 140 sites (at least) are known or predicted for this area. Reduction of the burro population to 13 animals should result in low to negligible negative impacts on cultural resources.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 28 Burro Concentration Area Piute Mtns.		(See Appendix 3-EIA-27 for specific species, range and concentration potntially impacted in this HMA.)	2 square miles of very high and 1 square mile of high cultural resource sensitivity/ significance have been designated in this area. 40 sites(at least) are known or predicted for the area. A burro population of 13 is expected to have little negative impact on cultural material.
HMA 29 Burro Range Dead Mtns.	Same as Protection.	Habitat quality would decline in much of the hred management area. Current desert bighorn use is transient; under this alternative they would be extirpated but the period for extirpation would be longer. Riparian areas would be severely degraded, this would include critical sheep water holes. Desert tortoise populations would declie. These impacts would result in all but the No Action Alternative.	3 sq. miles of very high and 50 sq. miles of high cultural resource sensitivity/significance plus 47 square miles of high to very high buried site potential are located in this area. 6 linear miles of significant historic roads/trails are present as well. At least 550 sites are known or predicted to occur in this area. A population of 35 burros would probably have low to moderate negative impacts overall, the impacts being more severe in certain locations.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 29 Burro Concentration Area Dead Mtns.		A total of 17,000 acres of bighorn range, 1300 acres of desert tortoise habitat and 32,000 acres of Prairie Falcon habitat would be impacted.	12 square miles of high cultural resoure sensitivity/ significance and 7 square miles of high to very high buried site potential are present. At least 150 sites are known or predicted in this area. Proposed population size of 35 burros is expected to have moderate negative impacts if concentrated here.
HMA 30 Burro Range Chemehuevi	Same as Protection.	In all but the No Action Alternative habitat quality would decline in manya reas of the herd management area especially the washes. Desert bighorn use and numers would decline; permanent range may become seasonal. Desert tortoise populations would decline at a moderate rate. Riparian areas would become degraded; this would include critical sheep water holes. (See Appendix 3-EIA-28 for specific species, range and concentration potentially impacted in this HMA.)	113 sq. miles of very high and 92 sq. miles of high cultural resource sensitivity/significance, 68 sq. miles of high to very high buried site potential, and 14 linear miles of significant historic roads/trails are present in the area. In addition, 2 National Register properties are present. Reduction of the burro population will be beneficial but 320 animals are judged to still have moderate negative impacts on cultural resources overall and even svere at some locations as has been occurring in the past. 2,650 sites as a minimum are known or predicted for the area.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 30 Burro Concentration Area			67 square miles of very high and 41 square miles of high cultural resource sensitivity/significance and 36 square miles of high to very high buried site potential are present. One National Register property is present as well. 1,150 is estimated to be the minimum number of sites present in the area. A burro population of 320 animals is expected to have moderate negative impacts overall with more severe negative impacts in certain locations.
HMA 31 Horse Concentration Area Palm Canyon	Same as Protection.	Good habitat condition, stable habitat trend and small and stable herd size indicate that maintaining the herd under current condition would not result in significant positive or negative impacts to wildlife in any alternative. Horses may exact a negative impact on riparian habitats reducing habitat for Summer Tanager. (See Appendix 3-EIA-29 for specific species, range and concentration potentially impacted in this HMA.)	9 square miles of very high and 10 square miles of high cultural resource sensitivity/significance and 21 square miles of high to very high buried site potential are present in the area. One National Register property is present as well. A minimum of 225 sites are known or predicted. A horse population of 2 is expected to have negligible impacts on cultural resources but certain locations could receive moderate negative impacts from this minimal population.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 32 Horse Range Coyote Canyon	Same as Protection.	In all alternatives removal of all horses will enable the habitat and permit the peninsular bighorn sheep to recover. Burro populations are unknown but appear to be small and are mapped; they have an unknown effect on wildlife. To be prudent one must assume negative impacts, declining bighorn herds and quality of riparian habitats.	Not assessed - Anza-Borrego
HMA 32 Horse Concentration Area		(See Apendix 3-EIA-30 for specific species, range, and concentration potentially impacted in this HMA.)	Not assessed - Anza-Borrego
HMA 33 Burro Range Chuckwalla	Impacts on UPAs and RT&Es same as No Action; proposed populations 15 burros; proposed vegetation use 0.4 lb/acre; overall impacts: Not significant.	In all alternatives habitat would decline in the concentration area. Desert bighorn use may decline from permanent to seasonal range. Desert tortoise popuations would declie. Riparian areas would be degraded and declines in species requiring these areas would occur. (See Appendix 3-EIA-31 for specific species, range and concentration potentially impacted in this HMA.)	77 square miles of very high and 13 square miles of high culturalr esource sensitivity/significance plus 275 square miles of high to very high buried site potential are present in the area. 42 linear miles of significant historic roads/trails are present as well. At least 3,600 sites are known or predicted in this large area. A population of 15 burros is expected to have negligible negative impacts except at certain locations where they may be low to moderate.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 33 Burro Concentration Area Chuckwalla			15 square miles of very high cultural resource sensitivity/significance plus 17 square miles of high to very high buried site potential are present in the area. 4 linear miles of significant historic roads/trails are present as well. 520 sites at a minimum are known or predicted for the area. These concentration areas will likely have low negative impacts on cultural resources with possibly moderate effects in some locations.
HMA 34 Burro Range (outside Chocolate Mountains Naval Gunnery Range only)	Same as Protection.	In all but the No Action Alternative wildlife would be benefited in a highly positive manner after burros are extirpated. Desert bighorn populations and riparian habitats would recover. Recovery would be quite slow as a result of the excessive number of burros and the fair condition of the range. (See Appendix 3-EIA-32 for specific species, range and concentartion potentially impacted in this HMA.)	18 square miles of very high and 5 square miles of high sensitivity, 40 square miles of high to very high potential for buried sites, 4 linear miles of historic trails, and 400 prehistoric/historic sites. Total removal of the herd will result in strongly positive impacts.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 34 Burro Concentration Area (outside Chocolate Mountains Naval Gunnery Range only)			11 square miles of very high and 4 square miles of high sensitivity, 22 square miles of high to very high potential for buried sites, and 260 prehistoric/historic sites are predicted or known. Total removal of the herd will result in strongly positive impacts.
HMA 35 Burro Range	Same as Protection.	In all but the No Action Alternative wildlife would be benefited in a highly positive manner after burros are extirpated. Desert bighorn populations and riparian habitats would recover. Recovery would be at a moderate pace as burro numbers were not too excessive. (See Appendix 3-EIA-33 for specific species, range and concentartion potentially impacted in this HAM.)	4 square miles of very high sensitivity, 6 square miles of high to very high buried site potential, and 325 prehistoric/historic sties are known or predicted. Total burro removal will result in strongly positive impacts over time.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 36 Burro Range Picacho	Same as Protection.	In all alternatives habitat quality would decline. Desert bighorn numbers would decline and use of the concentration and permanent ranges may become seasonal. Riparian habitat areas would continue to decline, thus includes critical sheep water holes. (See Appendix 3-EIA-34 for specific species, range and concentration potentially impacted in this HMA.)	2 square miles of very high and 52 square miles of high cultural resource sensitivity/significance plus 86 square miles of high to very high buried site potential are present in the area. 12 linear miles of significant historic roads/trails are present as well. A minimum of 750 sites are known or predicted for the area. A smaller herd (40 burros) would be better from the standpoint of cultural resources but would still likely have low negative impacts overall and moderate negative impacts in certain locations.
HMA 37 Horse Range Ash Meadows	Same as Protection.	Mathematical analysis of the impacts indicate that three alternatives would have a highly negative impact on wildlife. However, there are only an estimated 20 horses resident therefore all alternatives should have a negative impact. Habitat quality including riparian areas would decline. Permanent Nevada speckled dace populations would decline as a result of siltation and use of the shallow permanent water. (See Appendix 3-EIA-35 for specific species, range and concentration potentially impacted in this HMA.)	31 square miles of very high and 2 square miles of high cultural resource sensitivity/significance plus 67 square miles of high to very high buried site potenital are present. A minimum of 900 known or predicted sites are estimated. Herd size of 17 horses should have negligible negative impacts on cultural resources with the exception of certain locations.

DISCUSSION ITEM	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 37 Horse Concentration Area Ash Meadows			One square mile of very high cultural resource sensitivity/significance and 27 square miles of high to very high buried site potential are present. At least 250 sites are known or predicted for the area. A population of 17 horses is expected to have low negative impacts on cultural resources.

TABLE 3-EIA

Supplement to WHB-3

The following charts refer to the wildlife column of WHB-3 and describe the extent of habitat potentially impacted (in acres) for various species within the described Herd Management Area.

3-EIA-1: HMA-1 (Horse Range)

	Range
Black Toad	5,760
Black Toad habitat	3,200
Desert Bighorn	
Seasonal	12,160
(Former)	9,600
Palid Kangaroo Mouse	7,680
Yellow-breasted Chat	1,280
Desert Shrew	1 site
Panamint Alligator Lizard	1 site
Prairie Falcon	35,840
Mule Deer	40,320
Cottonwood Creek	1,280
Deep Springs Valley Shadscale Community	8,960

3-EIA-2: HMA-1 (Burro Range)

Black Toad	1 site
Desert Bighorn	
Seasonal	4,480
(Former)	4,480
Golden Eagle	32,000
Prairie Falcon	58,240
Pallid Kangaroo Mouse	9 sites
Panamint Alligator Lizard	1 site
Yellow-breasted Chat	1 site
Mule Deer	18,560
Cottonwood Creek	640

3-EIA-3: HMA 2 (Burro Range & Concentration)

	Range	Concentration Areas
Inyo Mountain Salamander	7,680	2,560
Desert Bighorn		
Concentration	320	320
Permanent	3,200	
Transient	70,400	
Seasonal	25,600	1,280
Golden Eagle	83,200	6,400
Prairie Falcon	83,200	6,400
Mule Deer	208,640	9,600
Panamint Chipmunks	3 sites	
Little Pocket Mouse	2 sites	
Yellow-breasted Chat	1 site	
Black-headed Snake	1 site	
Panamint Alligator Lizard	1 site	3,200
East Slope Inyo Mountain	17,920	640
Saline Valley Dunes	3,200	1,920
Salt Lake Mesquite	5,120	

3-EIA-4: HMA 3- Horse Range - Outside DVNM)

Desert Bighorn Sheep	
Permanent range	21,120
Transient range	51,200
Golden Eagle	24,960
Panamint Kangaroo Rat	21,120
Panamint Chipmunk	21,760
Gray Shrew	
Mule Deer	35,200
Panamint Alligator Lizard	
Grapevine Canyon	3,840

3-EIA-5: HMA 3 (Burro Range and Concentration)

	Range	Concentration Areas
Desert Bighorn	49,920	14,720
Permanent	27,520	10,880
Seasonal	1,920	
Transient	20,480	3,840
Panamint Kangaroo Rat	6,400	6,400
Desert Shrew	3 sites	3 sites
Panamint Chipmunk	40,320	19,200
Panamint Alligator Lizard	1 site	1 site
Mule Deer	19,200	6,400
Grapevine Canyon	5,120	1,280

3-EIA-6: HMA 4 (Burro Concentration)

Desert Bighorn		
Concentration		3,840
Seasonal		10,880
Mule Deer		80,000
Golden Eagle		12,800
Prairie Falcon		12,800

3-EIA-7/8: HMA 8 (Burro Range and Concentration - outside DVNM)

	Range	Concentration Areas
Desert Bighorn	94,920	10,880
Permanent	17,280	640
Seasonal	1,920	1,920
Transient	30,720	8,320
Chisel-toothed Kangaroo Rat	1 site	1 site
Golden Eagle	19,200	7,680
Mule Deer	92,800	17,920
Prairie Falcon	19,200	7,680
Townsends Big-eared Bat	1 site	

3-EIA-9/10: HMA 9 (Burro Range and Concentration)

Habitat Potentially Impacted	Range	Concentration
Desert Bighorn	327,680	26,240
Permanent	52,480	19,840
Seasonal	11,520	5,760
Transient	263,680	640
Corridor	3	1
Golden Eagle	96,000	14,720
Panamint Kangaroo Rat	2 sites	1 site
Prairie Falcon	96,000	14,720
Panamint Chipmunk	24,960	3,840
Townsends Big-eared Bat	9 sites	
Pallid Bat	3 sites	
Pacific Treefrog	4,480	
Panamint Alligator Lizard	1 site	
Black-headed Snake	1 site	
Mule Deer	248,960	54,400
West Panamint Canyon	48,640	3,840

3-EIA-11: HMA 11 (Burro Range - Outside China Lake NWC)

Golden Eagle	108,800 2 eyries
Inyo Brown Towhee	22,400
Towhee ACEC	10,240
Panamint Kangaroo Rat	1,280
Desert Bighorn	112,640
Concentration	4,480
Permanent	35,840
Seasonal	74,240
Corridor	1
Prairie Falcon	108,800
Townsends Big-eared Bat	1 site

3-EIA-12: HMA 12 (Burro Range)

Inyo Brown Towhee	10,240
Golden Eagle	7,680
Desert Bighorn	
Seasonal	37,120
Transient	37,760
Corridor	1
Panamint Kangaroo Rat	1 site
Pallid Bat	1site
Panamint Chipmunk	7,680
Mule Deer	44,160

3-EIA-13: HMA 12 (Horse Range - Outside China Lake NWC)

Inyo Brown Towhee	35,200
Towhee ACEC	10,240
Golden Eagle	183,040 3 eyries
Desert Bighorn	296,320
Transient	156,160
Permanent	35,200
Concentration	4,480
Corridor	100,480
Seasonal	1,280
Panamint Kangaroo Rat	23,040
Prairie Falcon	2 sites
Townsends Big-eared Bat	1 site
Pallid Bat	1 site
Chisel-toothed Kangaroo Rat	6,400
Panamint Chipmunk	124,800
Mule Deer	4,480
West Panamint Canyon Black Spring ACEC	640

3-EIA-14: HMA 13 (Burro Concentration)

Desert Bighorn (Transient)	2,560
Golden Eagle	17,920
Prairie Falcon	17,920
Chicago Valley Mesquite Thicket	5,760

3-EIA-15: HMA 14 (Burro Range)

Desert Tortoise (20-50/mi^2)	1,920
Desert Bighorn	27,520
Permanent	12,160
Seasonal	12,800
Concentration	2,560
Corridor	1
(Former range)	17,280
Prairie Falcon	1 eyrie
Superior Valley Joshua Tree Woodland	5,760

3-EIA-16: HMA 16 (Burro Range)

Golden Eagle	19,200 2 eyries
Desert Bighorn (Former Range)	16,000
Prairie Falcon	19,200
Newberry/Granite Mtns Raptor Breeding Area	16,000
Ord Mtn Jojoba Scrub	5,120

3-EIA-17/18: HMA 20 (Burro Range and Concentration Area)

	Range	Concentration
Summer Tanager	2 sites	1 site
Golden Eagle	36,480	9,600
Prairie Falcon	36,480	9,600
Gray Vireo	2 sites	1 site
Townsend's Big-eared Bat	1 site	
Mule Deer	54,400	19,840
Whitewater Canyon ACEC	12,160	8,320

3-EIA-19/20: HMA 21 (Burro Range and Concentration Area)

	Range	Concentration
Desert Tortoise	125	41
20-50/sq mi	98	23
50-100/sq mi	27	18
Ivanpah Desert Tortoise Crucial Habitat	37	37
Shadow Valley Tortoise Crucial Habitat	87	3
Desert Bighorn Sheep	53	
Permanent	32	2
Seasonal	21	
Corridor	2	
Golden Eagle	93	3
Kingston Mountain Chipmunk	60	
Gila Monster	1 site	1 site
Gray Vireo	20	1 site
Prairie Falcon	40	1
Rock Squirrel	11	1
Townsends Big-eared Bat	1 site	
Panamint Chipmunk	21	1
Mule Deer	61	16
Clark Mtn ACEC	28.5	

3-EIA-21: HMA 22 (Burro Range)Desert	39,040
Tortoise	35,840
20-50/sq mi	3,200
50-100/sq mi	23,040
Shadow Valley Desert Tortoise Crucial	7,680
Habitat	3,200
Desert Bighorn Sheep	4,480
Permanent	15,360
Seasonal	1 site
Golden Eagle	3,840
Townsend's Big-eared Bat	
Indian Springs ACEC	

3-EIA-22: HMA 23 (Burro Range and Concentration)

Desert Tortoise (20-50)	3,840
Desert Bighorn	35,840
Permanent	32,640
Transient	3,200
Golden Eagle	12,800
Black-tailed Snake	
Prairie Falcon	12,800
Rate Squirrel	7,040
Panamint Chipmunk	5,120
Mule Deer	12,800
Kelso Dunes ACEC	
Granite Mtn.	17,920

3-EIA-23: HMA 24 (Burro Range and Concentration)

	Range	Concentration
Desert Tortoise (50-100)	1,280	
Fenner-Chemehuevi D.T. crucial habitat	9,600	1,280
Desert Bighorn	49,920	20,480
Seasonal	17,920	2,560
Permanent	32,000	17,920
Golden Eagle	104,320	33,920
Panamint Chipmunk	9,600	9,600
Prairie Falcon	44,800	12,160
Black-headed Snake	640	640
Ring-necked Snake	640	640
Gila Monster	640	640
Rock Squirrel	640	640
Townsends Big-eared Bat	3 sites)	2 sites
Gray Vireo	640	
Mule Deer	104,320	33,920

3-EIA-24: HMA 25 (Burro Range and Concentration

Fenner Chemehuevi Desert Tortoise	10,240	1,920
Desert Bighorn	25,360	12,480
Permanent	6,400	5,760
Concentration	1,600	1,600
Seasonal	15,360	5,120
Golden Eagle	35,840	12,160
Prairie Falcon	35,840	12,160
Mule Deer	23,040	11,520

3-EIA-25: HMA 25 (Horse Range and Concentration)

Desert Bighorn (seasonal)	1,280	
Golden Eagle	17,280	5,760
Prairie Falcon	5,120	1,920
Mule Deer	3,200	

3-EIA-26: HMA 26 (Burro Range and Concentration)

	Range	Concentration
Golden Eagle	17,920	5,760
Panamint Kangaroo Rat	1,280	1,280
Prairie Falcon		2,560
New York Mts.		1,920
Cima Dome	23,040	3,200

3-EIA-27: HMA 28 (Burro Range and Concentration)

Desert Bighorn (Transient)	17,280	7,040
Desert Tortoise (20-50)	35,840	7,040
Fenner-Chemehuevi Des. Tortoise C.H.	35,840	7,040
Golden Eagle	21,760	5,120
Prairie Falcon	24,320	5,120

3-EIA-28: HMA 30 (Burro Range and Concentration)

Desert Bighorn (permanent)	27,520	27,520
seasonal	23,040	23,040
former	64,000	64,000
Introduction area	55,680	55,680
Desert tortoise (20-50/mi^2)	82,560	10,880
50-100/mi^2	62,720	6,400
100-250/mi^2	8,960	
Fenner-Chemehuevi Desert Tortoise Hab.	98,560	16,000
Mule Deer	124,800	124,800
Prairie Falcon	12,160	1,280
California Leaf-nosed Bat	1 roost	
Townsends Big-eared Bat	1 site	1 site
Whipple Mountains	21,760	21,760
Chemehuevi Wash	144,640	58,880
Vidal Wash	48,000	

3-EIA-29: HMA 31 (Horse Concentration)

Peninsular Bighorn (permanent)		960
Seasonal		10,240
Least Bells Vireo		1 site
Summer Tanager		1 site
Magic Gecko (possible Habitat)		13,440
Mule Deer		20,480
Santa Rosa Mountains		21,120

3-EIA-30: HMA 32 (Horse/Burro Range and Concentration)

	Burro Range	Burro Concentration
Peninsular Bighorn Sheep (concentration)	6,400	
permanent	15,360	
seasonal	19,200	
corridor	2	
Magic Gecko (possible habitat)	12,160	
Least Bells Vireo	1 site	
Flat-tailed horned lizard	6,400	
Prairie Falcon	12,800	
Mule Deer	40,960	
Colorado Fringe-toed Lizard	7,680	
	Horse	Horse
Peninsular Bighorn Sheep (concentration)	6,400	3,840
permanent	15,360	11,520
seasonal	19,200	
corridor	2	2
Magic Gecko (possible habitat)	12,160	12,160
Flat-tailed horned lizard	6,400	
Prairie Falcon	12,800	1,280
Mule Deer	66,560	33,280
Colorado Fringe-toed Lizard	7,680	

3-EIA-31: HMA 33 (Burro Range and Concentration)

Desert Bighorn Sheep (permanent)	17,920	6,720
seasonal	92,160	30,080
transient	16,640	
Desert tortoise (20-50/mi^2)	148,480	3,840
50-100/mi^2	71,680	17,280
100-250/mi^2	25,600	
Prairie Falcon	53,760	
Mule Deer	117,760	81,280
Elf Owl	640	640
Desert Shrew	1 site	1 site
Yellow-breasted Chat	1 site	1 site
California Leaf-nosed Bat	2 sites	1 site
Pallid Bat	1 site	1 roost
Brazilian Free-tailed Bat	1 site	1 site
Townsends Big-eared Bat	2 sites	1 site
Big Brown Bat	1 roost	
Cave Myotis	2roosts	
Pronghorn Rentoduston	3,840	
Chuckwalla Desert Tortoise	176,640	20,480
Chuckwalla Bench	47,360	
Chuckwalla Mountain	94,720	41,600

3-EIA-32: HMA 34 (Burro Range and Concentration)

	Range	Concentration
Black Rail	2 sites	2 sites
East Mesa Black Rail Habitat	3,840	2,880
Desert Bighorn Sheep (seasonal)	2,240	
Mule Deer	6,400	
Flat-tailed Horned Lizard	26,240	17,920

3-EIA-33: HMA 35 (Burro Range)

Desert Bighorn Sheep (seasonal)	6,400
Desert tortoise (20-50/mi^2)	16,640
Mule Deer	3,840
Pronghorn Reutebuster	16,000
Milpitas Wash	21,120

3-EIA-34: HMA 36 (Burro Range)

Desert Bighorn concentration	11,520
permanent	16,000
seasonal	5,760
Desert tortoise (20-50/mi^2)	1,920
Pallid Bat	1 site
Mule Deer	48,640

3-EIA-35: HMA 37 (Horse Range and Concentration)

Nevada Speckled Dace (permanent)	1,280	
seasonal	5,120	7,680
Golden Eagle	28,800	7,680
Prairie Falcon	28,800	7,680
Amargosa Toad/Potential Hab.	3,840	

TABLE WHB-4

FERAL HORSES AND BURROS ELEMENT IMPACTS
USE ALTERNATIVE

DISCUSSION	VEGETATION	WILDLIFE	CULTURAL RESOURCES
HMA 1 Pipir Mtn.	Impacts on UPA's: Same as No Action RT&E's: Same as No Action Proposed Pop's: 24 Horses, 84 Burros Proposed Veg. Use: Burros 53.6 lb./acre Horses 18.4 lb./acre Overall Impacts: Highly negative	See Balanced Alternative	Horse Range See Balanced Alternative for cultural resources. Population of 24 horses will probably have mild impacts overall, perhaps moderate negative impacts at certain locations. Reduction from supposed level of 40 animals would be positive. Burro Range See Balanced Alternative for Cultural resources. Herd of 84 burros would be expected to have mild to moderate negative impacts on cultural resources overall with moderate impacts undoubtedly at some locations. Reduction of herd from supposed population of 105 would be positive. Burro Concentration Area See Balanced Alternative for cultural resources. Concentration of above number of burros would have moderate to severe negative impacts on cultural resources in this area. Impacts would likely be worse if population is not reduced at all.
HMA 2 Saline Valley	Impacts on UPA's: Same as No Action RT&E's: Same as No Action	See Balanced Alternative	Burro Range

	Proposed Pop's: 800 Burros Proposed Veg. Use: Same as No Action Overall Impacts: highly negative		Same as Balanced Alternative for cultural resources and impacts.
			Burro Concentration Area Same as above.
HMA 3 (outside DVNM only) Hunter Mtn.	Impacts on UPA's: None RT&E's: Same as No Action Proposed Pop's: 37 Horses, 95 Burros Proposed veg. Use: Horses 9.2 lb/acre Burros 24 lb/acre Overall Impacts: highly negative	See Balanced Alternative	Horse Range Same as Balanced Alternative for cultural resources. Herd of 37 horses - impacts judged to be the same as Balanced Alternative.
HMA 3 (outside DVNM only) Burro Range		See Balanced Alternative	See Balanced Alternative for cultural resources. A population of 95 burros will have severe negative impacts on cultural resources overall and at specific locations in this small range.
HMA 3 (outside DVNM only) Burro Concentration Areas		See Balanced Alternative	See Balanced Alternative for cultural resources. Herd size of 95 animals would have severe negative impacts on cultural resources in the area.
HMA 4 (excludes DVNM and Nevada) Burro Concentration Area	Impacts on UPA's: None RT&E's: Same as No Action Proposed Pop's: 132 burros Proposed Veg. Use: 24.7 lb./acre Overall Impact: highly negative	See Balanced Alternative	See Balanced Alternative for cultural resources. A population of 123 burros is likely to have moderate negative impacts overall on cultural resources and perhaps severe impacts in certain locations.
HMA 5 Burro Range Lee Flat	Impacts on UPA's: Same as No Action RT&E's: None Proposed Pop's: 44 Burros Burros: 7.2 lb/acre	See Balanced Alternative	See Balanced Alternative for cultural resources. Herd size of 44 burros will probably have mild to moderate negative impacts on cultural resources.

HMA 6 Burro Range Centennial Valley	Impacts on UPA's; None RT&E's; None Proposed Pop's: 29 Burros Proposed Veg. Use: 15.3 lb./acre Overall Impact: Negative	Planned burro numbers would be reduced to a level where further declines in wildlife habitat values would be halted and recovery might begin. Serious negative impacts to water sources and riparia vegetation would be limited to the springs most heavily used by burros.	See Balanced Alternative for cultural resources. A population of 29 burros will probably result in mild negative impacts to cultural resources overall.
HMA 6 Burro Concentration Area Centennial Valley		See Balanced Alternative	See Balanced Alternative for cultural resources. A herd of 29 burros may have moderate negative impacts to cultural resources in this small area.
HMA 7 Burro Range Darwin	Impacts on UPA's; None RT&E's; None Proposed Pop's.: 92 burros Proposed Veg. Use: Burros: 53.4 lb/acre. Overall Impacts; highly negative	See Balanced Alternative	See Balanced Alternative for cultural resources. Herd population of 92 burros would have severe overall negative impacts on cultural resources.
HMA 7 Burro Concentration Area		See Balanced Alternative	Same as above
HMA 8 (outside DVNM only) Burro Range Towne Pass	Same as Protection	See Balanced alternative	Same as Balanced Alternative
HMA 8 (outside DVNM only) Burro Concentration Area		See Balanced Alternative	Same as above

HMA 9 (outside DVNM only) Burro Range Panamint Mtns.	Same as Protection	See Balanced Alternative	Same as Balanced Alternative
HMA 9 (outside DVNM only) Burro Concentration Area Panamint		See Balanced Alternative	Same as above
HMA 10 (outside Mojave B Range only) Burro Range State Range	Same as No Action	See Balanced Alternative	Same as Balanced Alternative
HMA 11 (outside China Lake NWC only) Burro Range Trona	Same as Protection	See Balanced Alternative	Same as Balanced Alternative
HMA 12 Burro Range Coso Basin	Impacts on UPA's; Same as No Action RT&E's: Same as No Action	See Balanced Alternative	Not assessed - Naval Weapons Center
HMA 12 (outside China Lake NWC only) Horse Range		See Balanced Alternative	See Balanced Alternative for cultural resources. A horse population of 230 animals will have moderate negative impacts overall.
HMA 13 Concentration Area Chicago Valley	Same As No Action	See Balanced Alternative	Same as Balanced Alternative
HMA 14 Burro Range	No Data Available	See Balanced Alternative	Not assessed - Mojave B Range

HMA 15 Burro Range	No Data Available	See Balanced Alternative	Not assessed - Mojave B Range
HMA 16 (outside Edwards AFB only) Burro Range Kramer	Same as Protection	See Balanced Alternative	Same as Balanced Alternative
HMA 18 Burro Range Ord Mtn.	Impacts on UPA's: Same as No Action RT&Es: None Proposed Pop's: 8 Burros Proposed Veg. Use: 5.3 lb/acre Overall Impact; no significant impact.	Habitat condition would generally improve, but specific sites such as water sources and riparian habitat receiving the highest use would be negatively affected.	See Balanced Alternative for cultural resources. A burro population of 8 would probably have mild negative impacts on cultural resources and perhaps moderate impacts on certain location.
HMA 19 Burro Range Cave Mtn.	Same as No Action	See Balanced Alternative	Same as Balanced Alternative
HMA 20 Burro Range Morongo	Impacts on UPA's: Same as No Action RT&E's: None Proposed Pop's: 9 Burros Proposed Veg. Use: 1.9 lb/acre Overall Impacts; No significant impacts	See Balanced Alternative	See Balanced Alternative for cultural resources. A burro population of 9 animals would have low overall negative impacts on cultural impacts.
HMA 20 Burro Concentration Area		See Balanced Alternative	Same as above
HMA 21 Burro Range Clark Mtn.	Impacts on UPA's: Same as No Action RT&E's: Same as No Action Proposed Pop's: 89 Burros Proposed Veg. Use: 6.1 lb/acre Overall Impact: negative	See Balanced alternative	See Balanced Alternative for cultural resources. A herd size of 89 burros would result in moderate impacts to cultural resources
HMA 21 Burro Concentration Areas Clark Mtn.		See Balanced Alternative	Same as above except moderate to severe

HMA 22 Burro Range Indian Spr.	Impacts on UPA's: Same as No Action RT&E's; Same as No Action Proposed Pop's; 43 burros Proposed Veg. Use: 2.9 lb/acre Overall Impacts: low negative	See Balanced Alternative	See Balanced Alternative for cultural resources. A burro population of 43 animals would undoubtedly have low negative impacts on cultural resources overall.
HMA 22 Burro Concentration Areas		See Balanced Alternative	See Balanced Alternative for cultural resources. Herd size of 43 burros will have moderate negative impacts on cultural resources.
HMA 23 Burro Range Granite Mtn.		See Balanced Alternative	See Balanced Alternative for cultural resources. 100 burros will result in moderate to severe negative impacts overall to cultural resources.
HMA 23 Burro Concentration Areas	Impacts on UPA's; None RT&E's; Same as No Action Proposed Pop's: 100 burros Proposed veg. Use: 17.2 lb/acre Overall Impacts; Negative	See Balanced Alternative	See Balanced Alternatives for cultural resources. Population of 100 burros will have severe negative impacts on cultural resources in the area.
HMA 24 Burro Range Providence Mt.	Impacts on UPA's and RT&E's; Same as No Action Proposed Pop's: 79 burros Proposed Veg. Use: 12.3 lb/acre Negative	Habitat conditions for most wildlife would be slightly improved relative to the existing situation, but would remain in an overall degraded condition due to planned high burro numbers. Competiting with Desert Bighorn and Mule Deer would occur at springs, and riparian vegetation would be degraded.	See Balanced Alternative for cultural resources. A reduced herd of 79 animals is likely to result in continued moderate negative impacts to cultural resources overall.
HMA 24 Burro Concentration		See Balanced Alternative	See Balanced Alternative for cultural resources. Proposed burro population if 79 is

Areas			likely to have severe negative impacts on cultural resources.
HMA 25 Burro Range Woods/Hackberry	Impact on UPA's and RT&Es; Same as No Action Proposed Pop's; 2 horses 40 burros Proposed Veg. Use; Burros; 8 lb/acre Horses; 4 lb/acre Overall Impacts: low negative	See Balanced Alternative	See Balanced Alternative for cultural resources. A herd size of 40 burros will ahve mild to moderate negative impacts overall on cultural resources.
HMA 25 Burro Concentration Areas		See Balanced Alternative	Same as Above
HMA 25 Horse Range		See Balanced Alternative	See Balanced Alternative for cultural resources. 2 horses would have negligible impacts on cultural resources overall.
HMA 25 Horse Concentration Area		See Balanced Alternative	Same as above
HMA 26 Burro Concentration Area Marl Spr.	Impacts on UPA's and RT&E's: None Proposed pop's: 8 burros Proposed Veg. Use: 8.3 lb/acre Overall Impacts: low negative	Habitat quality would be only slightly degraded or may actually improve riparian areas would still be degraded slightly as burro utilization is heavier in the riparian areas. This would include critical watering sources for wildlife. Desert tortoise numbers should stabilize.	See Balanced Alternative for cultural resources. A burro population of 8 animals would have low negative impacts on cultural resources.

HMA 27 Burro Range Cut Spr.	Impacts on UPA's and RT&E's. Proposed Pop's: 5 burros. Proposed Veg. Use; 13.2 lb/acre Overall Impacts; low negative.	See Balanced Alternative	See Balanced Alternative for cultural resources. 5 burros would be likely to have negligible to low negative impacts on cultural resources.
HMA 27 Burro Concentration Area		See Balanced Alternative	Same as above
HMA 28 Burro Range Piute Mts.	Same as Balanced	See Balanced Alternative	Same as Balanced Alternative
HMA 28 Burro Concentration Area Piute Mts.		See Balanced Alternative	Same as above
HMA 29 Burro Range Dead Mts.	Same as Protection	See Balanced Alternative	Same as Balanced Alternative
HMA 29 Burro Concentration Area Dead Mts.		See Balanced Alternative	Same as Balanced Alternative
HMA 30 Burro Range Chemehuevi	Same as Protection	See Balanced Alternative	Same as Balanced Alternative
HMA 30 Burro Concentration Area		See Balanced Alternative	Same as above
HMA 31 Horse Concentration	Same as Protection	See Balanced Alternative	Same as Balanced Alternative

Area Palm Canyon			
HMA 32 Horse Range Coyote Canyon	Same as Protection	See Balanced Alternative	Not assessed - Anza Borrego
HMA 32 Horse Concentration Area		See Balanced Alternative	Not assessed - Anza Borrego
HMA 33 Burro Range Chuckwalla	Same as Balanced	See Balanced Alternative	Same as Balanced Alternative
HMA 33 Burro Concentration Area Chuckwalla		See Balanced Alternative	Same as above.
HMA 34 (outside Choc. Mts. NGR only) Burro Range Chocolate Mts.	Same as Protection	See Balanced Alternative	Same as Balanced Alternative
HMA 34 (outside Choc. Mts. NGR only) Burro Concentration Area Chocolate Mts.		See Balanced Alternative	Same as above
HMA 35 Burro Range Milpitas Wash	Same as Protection	See Balanced Alternative	Same as Balanced Alternative
HMA 36 Burro Range Picacho	Same as protection	See Balanced Alternative	Same as Balanced Alternative
HMA 37	Same as protection except 16 horses and proposed	See Balanced Alternative	See Balanced Alternative

Horse Range Ash Meadow	vegetation use of 1.6 lb acre. Overall Impact; low negative		for cultural resources. Horse herd of 16 animals is expected to have negligible to mild negative impacts on cultural resources.
HMA 37 Horse Concentration Area Ash Meadow		See Balanced Alternative	Same as above